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THE MOTOR GASOLINE SURVEYS OF 1920 AND 1921

(A Sequel to Bulletin 191)

BY

N. A. C. SMITH

WASHINGTON
GOVERNMENT PRINTING OFFICE
1923

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THE MOTOR GASOLINE SURVEYS OF 1920 AND 1921.

By N. A. C. Smith.

INTRODUCTION.

This bulletin is published as a sequel to Bulletin 191,[1] which dealt with the characteristics of motor gasolines marketed in the United States during the years 1917 and 1919. Bulletin 191 contained the statement "Gasoline has become of such commercial and military importance that it is now practically indispensable." Nothing has happened since 1919 to weaken the force of that statement; on the contrary, it was emphasized during the summer of 1920 by local shortages of gasoline which resulted in considerable disorganization of motor traffic.

PURPOSE OF THE GASOLINE SURVEYS OF 1920 AND 1921.

The data collected during 1919 showed that the motor gasoline sold that year was quite different from that sold during 1917. The Bureau of Mines decided, therefore, that it would be advisable because of the disturbed market conditions during the last few years to keep in closer touch with changes in the character of commercial motor gasoline.

The greater part—probably at least 80 per cent—of all the gasoline produced in this country is used in motor cars, trucks, and tractors. Changes in motor gasoline can often be compensated for by corresponding changes in the design of motor cars, but the designer of motor equipment is necessarily handicapped unless he knows how rapidly the fuel is changing. It has been common practice in the past to design a motor car to use efficiently the motor gasoline available at the time. Experimental cars were then built and tested, and eventually the new model was placed on the market, but so rapid have been the changes in refining practice during the last few years that it has frequently happened that the character of motor gasoline had radically changed by the time the new car was actually in the hands of the public.

[1] Hill, H. H., and Dean, E. W., Quality of gasoline marketed in the United States: Bull. 191, Bureau of Mines, 1921, 275 pp.

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The Bureau of Mines has kept careful records for several years of the actual production and consumption of motor gasoline and other petroleum products, but these statistics alone are not enough to portray clearly the gasoline situation at any one time. Not only the total amount of gasoline available, or the total production and consumption, but the characteristics of this gasoline must be known. In order to ascertain any changes in quality the bureau decided to make frequent surveys of the motor gasoline sold throughout the United States.

SCOPE OF THE PRESENT BULLETIN.

To obtain reliable data with a minimum of time and expense, the survey of 1919 was critically studied. The result demonstrated that a number of cities could be selected as representing different sections of the country, for the average of all the analyses of the gasolines marketed in those cities was very close to the average figures for the whole country. The cities selected were New York (including Brooklyn), Washington, Pittsburgh, Chicago, New Orleans, Salt Lake City, and San Francisco (including Berkeley), and samples were collected therefrom in January and July, 1920. In January, 1921, St. Louis and Cincinnati were also included, as it was felt that samples collected in Chicago and New Orleans would hardly represent the enormous consumption of gasoline in the central States. It was found, however, that Cincinnati apparently obtained most of its gasoline from nearby refineries, and consumed very little of the grade of gasoline commonly sold throughout that region. In July, 1921, therefore, Cincinnati was dropped from the list and Denver was added. This selection of cities seems to give a well-balanced set of samples, and although the present surveys are not as comprehensive as those previously made, the work has been so systematized and simplified that the surveys can be made twice a year instead of once every two years, as previously done. The present bulletin includes complete details of analyses of each sample collected in the four surveys made in 1920 and 1921, tables and charts showing comparative results, and a brief discussion of the variations in quality developed by the surveys.

ACKNOWLEDGMENTS.

Especial credit is due to A. W. Ambrose, former chief petroleum technologist, and to J. O. Lewis, former chief petroleum technologist of the Bureau of Mines, for advice on plans for the work and on the best methods of conducting it. The cordial cooperation and assistance of H. H. Hill and E. W. Dean, who carried out the 1917 and 1919 surveys, is gratefully acknowledged.

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The following members of the petroleum division of the bureau assisted in collecting samples: C. P. Bowie, E. C. Lane, L. A. Penn, and J. S. Desmond of the San Francisco office; M. J. Gavin, L. C. Karrick, and J. J. Jakowsky of the Intermountain station, Salt Lake City; L. H. Sharp of the Boulder, Colo., office; D. D. Stark, W. B. Lerch, and A. D. Bauer of the Pittsburgh, Pa., station; and C. R. Bopp and P. A. Draper of the Washington office. The samples were collected under the general supervision of W. A. Jacobs of the Pittsburgh station, whose enthusiastic interest in the work has contributed largely to its success.

The cooperation of refiners and marketers of gasoline is also acknowledged. Representatives of the bureau have reported a general spirit of cooperation and helpfulness in obtaining the necessary samples.

The samples were analyzed by the following members of the petroleum division: A. D. Bauer, C. R. Bopp, H. B. Cooke, P. A. Draper, W. B. Lerch, H. P. Rue, and D. D. Stark.

In order to bring the results of the surveys included in this bulletin to the attention of the public in the shortest possible time, preliminary reports[2] were issued as soon as possible after each survey had been made. The present bulletin, however, gives much more complete data. All figures and calculations have been rechecked and a few slight errors, due to the haste in publication of the previous reports, have been corrected.

GENERAL INFORMATION ON GASOLINE.

In view of the complete discussion of the economic factors involved in the production and consumption of motor gasoline presented in Bulletin 191,[3] it seems unnecessary to do more than point out the few changes that have taken place since that publication was issued. These changes are shown by graphs (Figs. 1, 2, and 3).

ECONOMIC DATA.

Figure 1 contains the same kind of data as Figure 4 in Bulletin 191, but for convenience in extending the curves the unit taken is 1,000,000 gallons, and the consumption curve is omitted. The seasonal variations in stocks, and the general trend toward an increase in both production and in stocks of gasoline are evident.

[2] Smith, N. A. C., and Bopp, C. R., Motor-gasoline survey: Monthly reports of investigations, February, 1920; Smith, N. A. C., Motor-gasoline survey: Monthly reports of investigations, Serial No. 2149, July, 1920; Third semiannual motor-gasoline survey: Monthly reports of investigations, Serial No. 2220, February, 1921; Fourth semiannual motor-gasoline survey: Monthly reports of investigations, Serial No. 2272, August, 1921.

[3] Hill, H. H., and Dean, E. W., Quality of gasoline marketed in the United States: Bull. 191, Bureau of Mines, 1921, pp. 4-33.

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The increased demand for gasoline is shown in Figure 2, which corresponds to Figure 6 in Bulletin 191. It will be noted that the demand for gasoline, as indicated by the number of cars and trucks registered, has increased steadily. The manufacture of gasoline and the production of crude oil have also increased, but at a much slower rate.

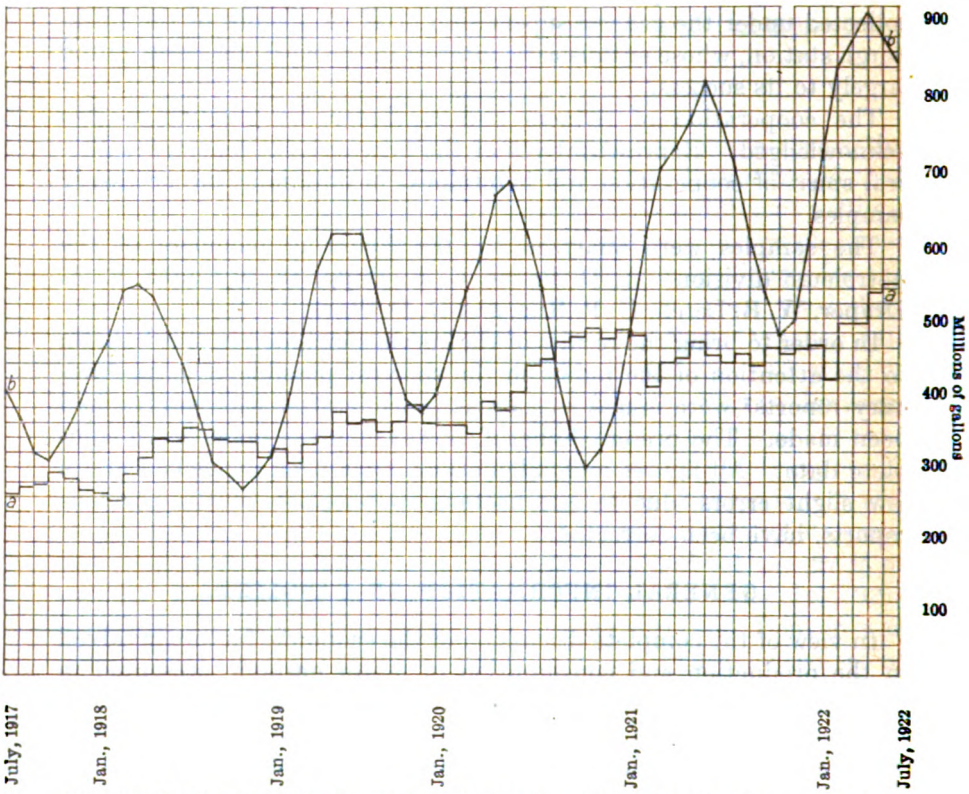

FIGURE 1.—Variations in production and in stocks of gasoline, July, 1917, to July, 1922; *a*, production; *b*, stocks.

PRICES.

That prices of gasoline are becoming relatively stable is shown by Figure 3, where the decided fluctuations of prices for crude oil in recent years contrast with the comparatively small changes in the price of gasoline.

DETAILS OF PRESENT SURVEYS.

SELECTION OF DATES FOR THE SURVEYS.

It was pointed out in Bulletin 191[4] that a number of companies market in summer grades of gasoline differing from those they market in winter, the latter grades containing a higher percentage of volatile

[4] Work cited, p. 36.

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material to facilitate the operation of motors in cold weather. To obtain some data on this practice, the surveys were made in January and July, as it was felt that during these months gasolines of winter and summer quality would certainly be marketed if at all.

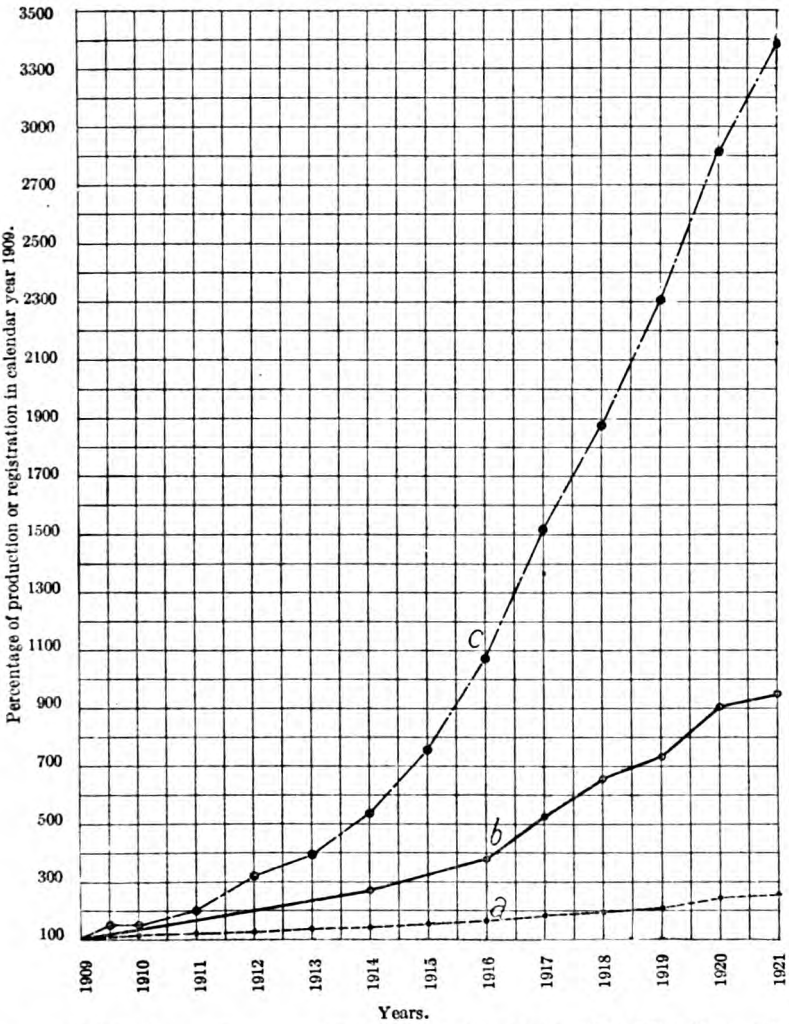

FIGURE 2.—Relative increase in number of motor cars and trucks registered in United States, output of crude oil, and production of gasoline. *a*, Output of crude oil; *b*, production of gasoline; *c*, motor cars and trucks.

SELECTION OF SAMPLES.

Eighty-one samples of motor gasoline were collected by the bureau in January, 1920. By collecting them in a few cities, as stated above, it was possible to obtain all the samples within a period of 10 days. Eighty-two samples were collected in July, 1920, whereas 115 samples were collected in each of the surveys in 1921.

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METHODS USED IN COLLECTING SAMPLES.

All samples were collected by representatives of the bureau, and practically every sample represents gasoline that was actually being

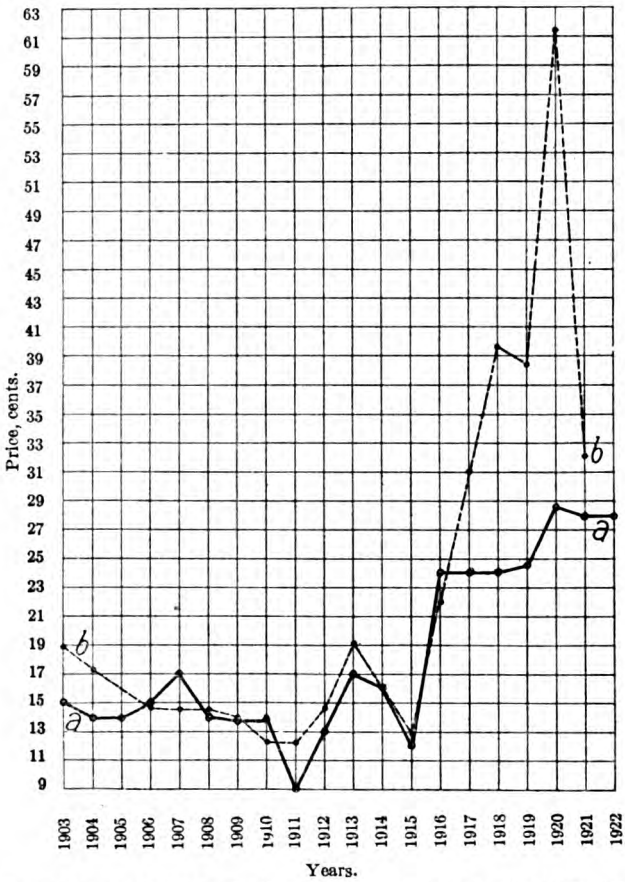

FIGURE 3.—Prices of gasoline and of crude oil. *a*, Wholesale price per gallon of gasoline in New York City; *b*, average price of one-fifth barrel of crude petroleum.

sold to consumers. The method of taking samples was the same as that described in Bulletin 191.[5]

METHODS USED IN TESTING SAMPLES.

The methods of testing were those described in Bulletin 191,[6] with the following exceptions:

COLOR.

In the present surveys, color was determined by means of the Saybolt Universal chromometer, and Saybolt numbers have been used in this bulletin. On this scale, No. 16 color is ordinarily considered

[5] Work cited, pp. 36–39.

[6] Work cited, pp. 39–42.

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to represent "prime white," No. 21 color "water white," and No. 25 represents the lightest color measurable with the instrument. A number of samples proved even lighter than this very light shade; these have been reported as +25.

ODOR.

The odor of each sample was noted, but odor has so little importance it is not reported here.

ACIDITY.

Acidity was determined by means of methyl orange as indicated in Bulletin 191. However, it has not been reported in detail, as the only samples in the four surveys that showed an acid reaction were those which were known to contain alcohol.

CORROSION AND GUMMING TEST.

After the survey of 1919 was completed, considerable experimental work was done in the Bureau of Mines laboratories to improve the test for corrosion and gumming. As the results showed conclusively that the test is not satisfactory for motor gasoline, it was not applied in the surveys of 1920 and 1921.

RECOVERY.

Since the publication of Bulletin 191 the bureau laboratories have adopted the practice of measuring the amount of distillate recovered in the receiver. The amount is reported as "recovery" in this bulletin; it does not include the residue left in the flask at the end of the distillation.

PRESENTATION OF RESULTS.

The detailed results of laboratory tests of the 393 samples collected in these four surveys are given in Tables 2, 3, 4, and 5. Table 2 includes the samples collected in January, 1920; Table 3, in July, 1920; Table 4, in January, 1921; and Table 5, in July, 1921. A consecutive series of numbers is used to identify the samples, and each company manufacturing gasoline is designated by a number also. The numbers are the same as those used in Bulletin 191 except that new company "numbers" were assigned any new companies marketing gasoline. The same terminology as before is used to designate the sources from which the samples were collected, such as G for garage, F for filling station, etc. The other figures in the four tables are self-explanatory.

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DISCUSSION OF RESULTS.

As the present surveys cover only a small number of cities, it has not been considered advisable to compare closely the specific features of the gasolines, as was done in discussing the survey of 1919. Average analyses of the gasolines marketed in the cities covered by the surveys of 1917, 1919, 1920, and 1921 are, however, given in Table 1.

RELATION BETWEEN 90 PER CENT POINT AND VOLATILITY.

In the study of a distillation analysis of a sample of gasoline, the 90 per cent point seems to be in many ways the best index of volatility. When the 90 per cent point is low, the volatility is high; as the 90 per cent point increases, the volatility decreases.

CHANGES IN VOLATILITY.

Examination of Table 1 indicates that practically all the gasolines have shown a net decline in volatility since 1917. No samples were collected during 1917 from either New York or Washington. It will be seen, however, that the 90 per cent points increased 9° F. in New York and 6° F. in Washington from April, 1919, to July, 1921. In Pittsburgh, a great change is noted from 1917 to 1921, the 90 per cent point increasing 56°, from 327 to 383° F. It should be noted, however, that the figures for Pittsburgh have fluctuated greatly from one survey to the next. Cincinnati was reported in only three surveys, but the 90 per cent increased from April, 1917, to January, 1921. In Chicago, the four-year increase in the 90 per cent point was 32°; in New Orleans, 24°; in St. Louis, 38°; in Denver, 43°; in Salt Lake City, 55°; and in San Francisco, 68° F.

CHANGES IN SPECIFIC GRAVITY.

The decrease in volatility is in general associated with an increase in specific gravity and a decrease in Baumé gravity; but an inspection of the figures shows that this is not universally true, nor is the change in gravity as marked as the change in volatility. Evidently, either a larger proportion of the gasoline sold is made from Western and Mid-Continent crudes, or a larger proportion of cracked gasoline is being marketed.

CHANGES IN UNSATURATION.

The figures for unsaturation seem to indicate that, in general, more cracked gasoline was used in 1920 and 1921 than in 1917. Too much reliance, however, must not be placed on these figures, as they are known to be somewhat misleading. During the years immediately after the war, considerable industrial alcohol was used as motor fuel,

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and a few of the samples collected contained large quantities of alcohol. As alcohol is soluble in concentrated sulphuric acid, the unsaturation figure of a motor fuel containing it is fictitiously high. Another reason for doubting the testimony of figures for unsaturation is that the manufacturers of cracked gasoline seem to be making a much more saturated product now than a few years ago.

WINTER AND SUMMER QUALITY.

Table 1, particularly the surveys of January and July, 1920, brings out strikingly the difference between winter and summer gasolines. Differences in the whole distillation range are found in practically every city. The surveys of 1921 do not exhibit this marked change in quality. Statistics compiled by the Bureau of Mines show that a probable explanation is that during the first half of 1921 the production, and consequently the available stocks of gasoline, increased much more than during the corresponding period of 1920. On account of their large stocks of gasoline, the refiners were not forced to increase production at the expense of volatility.

CHANGES IN AVERAGE GASOLINE THROUGHOUT THE COUNTRY.

The actual changes in the average quality of gasoline since April, 1917, is probably best shown by Figure 4. The initial, 20 per cent, 50 per cent, 90 per cent, end point, and average boiling points are plotted so as to show the change in each point from one survey to the next. These figures are averages for the entire set of samples collected in each survey. Table 1 includes no samples from New York or Washington in April, 1917, but as samples were collected in other cities on the Atlantic coast the 1917 survey, on the whole, is well balanced, and the average figures probably represent adequately the average gasoline sold at that time in the United States.

Figure 4 shows that there has been little real change in the initial or 20 per cent points, although there has been some fluctuation from one survey to the next. The 50 per cent point and average boiling point show a slight but steady increase, which confirms the statement made above that the average volatility of gasoline has steadily decreased in the past four years. This decrease in volatility is, however, more strikingly brought out by the curves for the 90 per cent point and end point; these curves are nearly parallel, and show a very decided increase. The decrease in volatility in the summer of 1920 is particularly evident.

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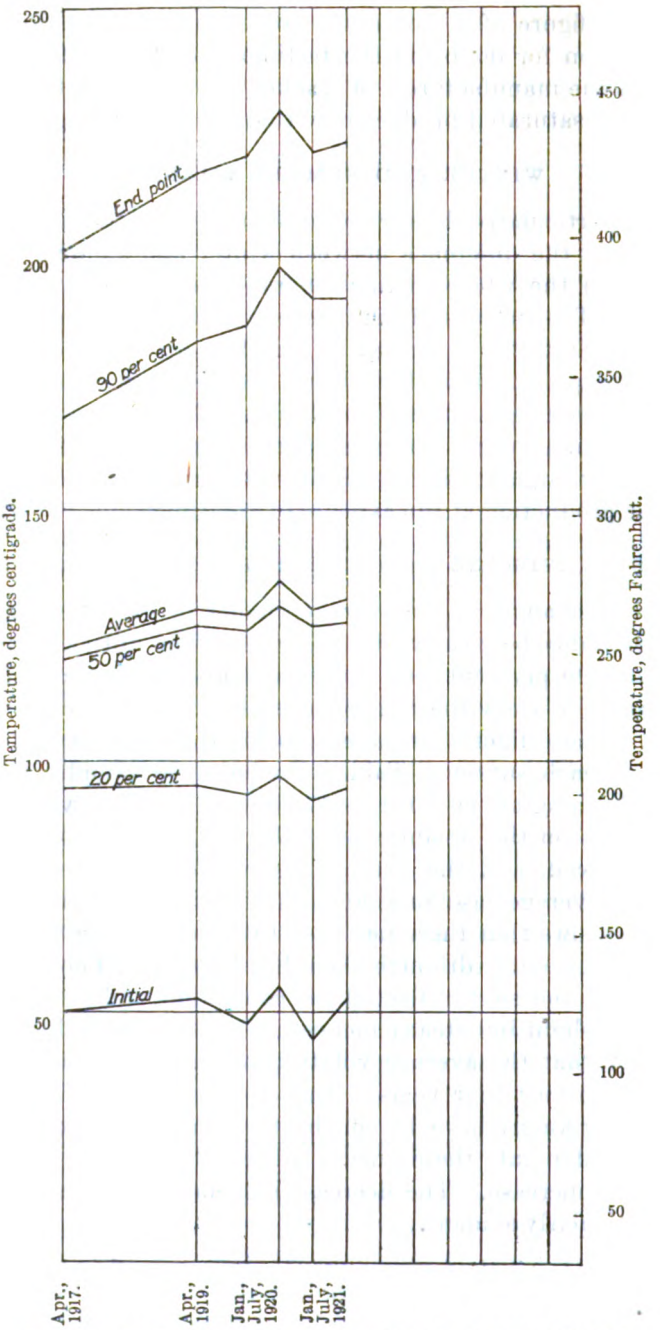

FIGURE 4.—Distillation ranges of average gasolines, April, 1917, to July, 1921.

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RELATION BETWEEN 50 PER CENT AND AVERAGE BOILING POINTS.

Another interesting fact is brought out by Figure 4, namely, the curve of average boiling point is almost identical with the 50 per cent curve, and the average boiling point is in general only a few degrees higher than the 50 per cent point. This has also been found true for most samples of gasoline, but not for all, as excessive proportions of high-boiling constituents may change the relationship of these two points very decidedly.

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TABLE 1.—*Average analyses of gasolines marketed in several cities, April, 1917, to July, 1921.*

NEW YORK.

Date.	Specific gravity.	Baumé gravity.	Unsaturation (per cent).	Distillation range.[1] Initial boiling point.	10 per cent.	20 per cent.	30 per cent.	40 per cent.	50 per cent.	60 per cent.	70 per cent.	80 per cent.	90 per cent.	End point.	Average boiling point.	Recovery (per cent).	Distillation loss (per cent).	Number of samples.
April, 1917[2]																		
April, 1919	0.742	58.7	3.5	129	189	210	226	241	259	275	298	322	358	412	266		1.8	9
				54	87	99	108	116	126	135	148	161	181	211	130			
January, 1920	.741	58.9	5.9	122	181	203	225	241	255	273	291	315	354	419	262	97.2	1.5	10
				50	83	95	107	116	124	134	144	157	179	215	128			
July, 1920	.744	58.2	2.5	133	187	210	230	248	264	284	306	331	374	432	271	97.0	1.8	11
				56	86	99	110	120	129	140	152	166	190	222	133			
January, 1921	.742	58.7	3.5	117	176	207	228	246	264	282	302	327	363	417	266	96.7	1.9	14
				47	80	97	109	119	129	139	150	164	184	214	130			
July, 1921	.738	59.7	5.9	126	180	208	228	246	264	284	304	329	365	421	270	96.6	2.2	16
				52	82	98	109	119	129	140	151	165	185	216	132			

WASHINGTON.

Date.	Specific gravity.	Baumé gravity.	Unsaturation (per cent).	Distillation range.[1] Initial boiling point.	10 per cent.	20 per cent.	30 per cent.	40 per cent.	50 per cent.	60 per cent.	70 per cent.	80 per cent.	90 per cent.	End point.	Average boiling point.	Recovery (per cent).	Distillation loss (per cent).	Number of samples.
April, 1917[2]																		
April, 1919	0.737	60.0	3.8	111	163	190	219	244	270	289	316	340	381	426	264		3.3	5
				44	73	88	104	118	132	143	158	171	194	219	129			
January, 1920	.753	55.9	10.6	126	176	201	219	235	255	280	300	329	381	439	268	97.0	1.7	10
				52	80	94	104	113	124	138	149	165	194	226	131			
July, 1920	.745	57.9	5.4	131	172	199	223	248	273	297	324	356	396	450	279	96.4	2.4	13
				55	78	93	106	120	134	147	162	180	202	232	137			
January, 1921	.753	55.9	6.7	118	172	201	221	241	259	279	309	343	385	439	270	97.0	1.5	10
				48	78	94	105	116	126	137	154	173	196	226	132			
July, 1921	.756	55.2	8.4	129	178	205	225	243	262	284	311	343	387	442	273	96.8	1.9	12
				54	81	96	107	117	128	140	155	173	197	228	134			

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PITTSBURGH.

April, 1917	0.716	65.5	1.4	109	154	178	198	216	230	248	266	288	327	385	235	.....	2.3	13
				43	68	81	92	102	110	120	130	142	164	196	113			
April, 1919	.736	60.2	2.2	102	156	189	217	241	264	284	309	340	387	430	266	.....	3.5	15
				39	69	87	103	116	129	140	154	171	197	221	130			
January, 1920	.730	61.8	2.7	100	147	181	210	234	257	277	302	333	376	424	259	94.9	3.8	15
				38	64	83	99	112	125	136	150	167	191	218	126			
July, 1920	.733	61.0	2.6	127	169	196	223	244	262	286	315	349	399	455	275	95.5	2.7	14
				53	76	91	106	118	128	141	157	176	204	235	135			
January, 1921	.726	62.8	2.0	93	142	163	199	225	248	277	307	345	372	430	255	92.9	5.5	20
				34	61	73	93	107	120	136	153	174	189	221	124			
July, 1921	.734	60.7	2.6	111	156	181	203	225	246	271	302	338	383	435	259	95.9	2.8	21
				44	69	83	95	107	119	133	150	170	195	224	126			

CINCINNATI.

April, 1917	0.735	60.5	1.5	120	180	199	217	234	250	266	284	306	338	399	255	.....	2.6	9
				49	82	93	103	112	121	130	140	152	170	204	124			
April, 1919	.737	60.0	2.6	118	174	198	216	232	246	266	288	309	345	412	255	.....	1.3	6
				48	79	92	102	111	119	130	142	154	174	211	124			
January, 1920 [2]																		
July, 1920 [2]																		
January, 1921	.733	61.0	1.7	113	167	194	219	239	259	280	304	329	367	423	262	96.5	2.1	11
				45	75	90	104	115	126	138	151	165	186	217	128			
July, 1921 [2]																		

CHICAGO.

April, 1917	0.738	59.7	1.7	113	171	201	225	244	262	280	302	325	356	412	262	.....	1.7	11
				45	77	94	107	118	128	138	150	163	180	211	128			
April, 1919	.779	49.7	4.4	122	171	194	214	234	253	273	295	327	369	424	261	.....	1.6	6
				50	77	90	101	112	123	134	146	164	187	218	127			
January, 1920	.756	55.2	4.9	117	171	199	223	241	262	284	307	338	381	444	270	96.3	2.3	15
				47	77	93	106	116	128	140	153	170	194	229	132			
July, 1920	.764	53.2	2.8	142	180	203	225	241	259	280	316	351	399	455	277	96.5	2.4	9
				61	82	95	107	116	126	138	158	177	204	235	136			
January, 1921	.759	54.5	2.2	117	169	190	212	232	248	270	298	340	387	421	264	96.1	2.4	14
				47	76	88	100	111	120	132	148	171	197	216	129			
July, 1921	.759	54.5	3.9	126	178	201	223	241	261	284	311	345	388	444	273	97.0	1.7	15
				52	81	94	106	116	127	140	155	174	198	229	134			

[1] In the double lines of figures, the top line represents degrees Fahrenheit; the lower, degrees centigrade.

[2] No samples collected.

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TABLE 1.—*Average analyses of gasolines marketed in several cities, April, 1917, to July, 1921*—Continued.

NEW ORLEANS.

Date.	Specific gravity.	Baumé gravity.	Unsaturation (per cent).	Distillation range.[1] Initial boiling point.	10 per cent.	20 per cent.	30 per cent.	40 per cent.	50 per cent.	60 per cent.	70 per cent.	80 per cent.	90 per cent.	End point.	Average boiling point.	Recovery (per cent).	Distillation loss (per cent).	Number of samples.
April, 1917	0.738	59.7	1.0	120	183	203	232	248	264	280	300	322	351	412	266	.....	1.3	7
				49	84	95	111	120	129	138	149	161	177	211	130			
April, 1919	.747	57.4	4.1	131	185	210	228	246	266	286	313	334	374	435	273	.....	1.8	7
				55	85	99	109	119	130	141	156	168	190	224	134			
January, 1920	.742	58.7	3.3	129	180	205	223	241	257	275	295	320	354	424	264	97.5	1.2	8
				54	82	96	106	116	125	135	146	160	179	218	129			
July, 1920	.747	57.4	3.0	136	199	223	243	261	280	298	320	343	383	444	284	97.1	1.7	8
				58	93	106	117	127	138	148	160	173	195	229	140			
January, 1921	.743	58.4	1.1	124	185	210	230	250	270	289	309	333	367	428	271	97.7	1.0	12
				51	85	99	110	121	132	143	154	167	186	220	133			
July, 1921	.744	58.2	2.9	131	187	214	239	259	279	300	320	343	376	428	279	97.0	1.9	11
				55	86	101	115	126	137	149	160	173	191	220	137			

ST, LOUIS.

Date.	Specific gravity.	Baumé gravity.	Unsaturation (per cent).	Distillation range.[1] Initial boiling point.	10 per cent.	20 per cent.	30 per cent.	40 per cent.	50 per cent.	60 per cent.	70 per cent.	80 per cent.	90 per cent.	End point.	Average boiling point.	Recovery (per cent).	Distillation loss (per cent).	Number of samples.
April, 1917	0.740	59.2	2.2	124	180	203	223	237	253	270	288	309	345	412	259	.....	1.3	11
				51	82	95	106	114	123	132	142	154	174	211	126			
April, 1919	.745	57.9	2.5	127	178	205	226	248	268	289	311	336	374	439	271	.....	2.1	13
				53	81	96	108	120	131	143	155	169	190	221	133			
January, 1920 [2]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
July, 1920 [2]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
January, 1921	.742	58.7	1.5	113	171	203	228	250	271	293	316	347	381	444	273	95.9	2.8	16
				45	77	95	109	121	133	145	158	175	194	229	134			
July, 1921	.746	57.7	3.6	129	181	205	226	248	268	291	315	343	383	441	275	96.6	2.2	16
				54	83	96	108	120	131	144	157	173	195	227	135			

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DENVER.

April, 1917	0.737	60.0	1.7	118	172	198	217	234	252	271	293	318	356	435	259	.....	1.9	9
				48	78	92	103	112	122	133	145	159	180	224	126			
April, 1919	.745	57.9	3.1	127	180	201	221	237	257	277	298	324	363	426	264	.....	1.8	9
				53	82	94	105	114	125	136	148	162	184	219	129			
January, 1920 [1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
July, 1920 [1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
January, 1921 [1]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
July, 1921	.750	56.7	2.3	133	189	214	235	253	275	302	327	356	399	459	286	97.0	1.7	6
				56	87	101	113	123	135	150	164	180	204	237	141			

SALT LAKE.

pril, 1917	0.754	55.7	1.0	131	178	196	210	219	230	241	253	271	297	349	234	.....	1.7	12
				55	81	91	99	104	110	116	123	133	147	176	112			
ril, 1919	.754	55.7	8.1	117	174	207	234	253	279	304	331	365	406	442	282	.....	2.2	8
				47	79	97	112	123	137	151	166	185	208	228	139			
uary, 1920	.749	56.9	5.9	113	174	205	225	246	266	291	316	345	387	441	273	97.1	1.9	8
				45	79	96	107	119	130	144	158	174	197	227	134			
1920	.755	55.4	6.1	126	185	212	235	257	280	302	333	363	406	457	288	97.1	1.7	12
				52	85	100	113	125	138	150	167	184	208	236	142			
y, 1921	.751	56.4	7.8	113	171	207	234	255	282	309	334	361	399	439	282	96.4	1.9	6
				45	77	97	112	124	139	154	168	183	204	226	139			
21	.742	58.7	6.1	127	176	199	219	237	255	273	295	318	352	401	261	96.6	2.4	6
				53	80	93	104	114	124	134	146	159	178	205	127			

SAN FRANCISCO.

.....	0.747	57.4	1.0	117	171	189	201	212	221	230	243	261	288	343	225	.....	1.3	8
				47	77	87	94	100	105	110	117	127	142	173	107			
.....	.754	55.7	1.4	135	181	201	216	228	241	253	270	291	327	374	246	.....	3.0	11
				57	83	94	102	109	116	123	132	144	164	190	119			
.....	.760	54.2	1.9	129	187	212	228	243	259	273	291	311	347	406	262	97.0	1.8	15
				54	86	100	109	117	126	134	144	155	175	208	128			
.....	.762	53.7	0.9	124	189	214	234	248	264	282	302	325	363	428	270	97.0	1.8	15
				51	87	101	112	120	129	139	150	163	184	220	132			
.....	.762	53.7	1.8	120	183	210	230	246	262	279	298	320	356	417	266	97.0	1.4	12
				49	84	99	110	119	128	137	148	160	180	214	130			
.....	.762	53.7	1.5	129	183	205	226	243	259	277	297	320	356	421	264	97.0	1.9	12
				54	84	96	108	117	126	136	147	160	180	216	129			

the double lines of figures the top line represents degrees Fahrenheit; the lower, degrees centigrade.

[1] No samples collected.

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TABLE 2.—*Analyses of gasolines*

Sample No.	City.	Company No.	Sample collected from [1]	Price (cents per gallon).		Gravity at 60° F.		Color, Saybolt.	Unsaturation (per cent).	Doctor test.[2]
				Retail.	Tank wagon.	Specific gravity.	Baumé.			
1	New York	21	G	29.0	26.5	0.737	60.0	25	8	—
2	do	5	F	30.0	26.5	.743	58.4	25	3	—
3	do	1	G	29.0	26.5	.753	55.9	25	14	—
4	do	2	G	30.0	26.5	.738	59.7	25	8	—
5	do	11	G	30.0	26.5	.732	61.3	25	2	—
6	do	5	F	30.0	27.0	.745	57.9	25	4	—
7	do	21	F	30.0	27.0	.735	60.5	25	8	—
8	do	2	F	30.0	26.5	.741	58.9	25	6	—
9	do	11	D	30.0	26.5	.730	61.8	25	4	—
10	do	1	F	30.0	27.0	.755	55.4	25	2	—
11	Washington	116	D	25.5	24.5	.738	59.7	25	6	—
12	do	116	D	32.0	31.0	.711	66.9	25	3	—
13	do	199	D	25.5	24.5	.743	58.4	25	4	—
14	do	1	D	25.5	24.5	.746	57.7	25	7	—
15	do	7	F	27.0	24.5	.740	59.2	25	2	—
16	do	1	F	27.0	24.5	.746	57.7	25	5	—
17	do	7	D	27.0	24.5	.738	59.7	25	5	—
18	do	199	F	26.0	24.5	.743	58.4	25	6	—
19	do	252	F	33.0	30.0	.812	42.4	25	34	—
20	do	252	F	33.0	30.0	.812	42.4	25	34	—
21	Pittsburgh	87	S	29.0	.....	.724	63.4	25	4	—
22	do	18	F	29.0	.....	.740	59.2	25	1	—
23	do	20	F	29.0	.....	.742	58.7	25	1	—
24	do	61	F	32.0	.....	.712	66.6	25	2	—
25	do	164	F	31.4	.....	.726	62.8	25	4	—
26	do	61	F	29.0	.....	.716	65.5	25	2	—
27	do	2	F	29.0	.....	.730	61.8	25	2	—
28	do	18	F	31.0	.....	.712	66.6	25	2	—
29	do	87	S	32.0	.....	.712	66.6	25	4	—
30	do	165	F	28.0	.....	.737	60.0	25	4	—
31	do	211	F	30.0	.....	.737	60.0	25	1	—
32	do	20	F	31.0	.....	.718	65.0	25	2	—
33	do	251	S	27.0	.....	.730	61.8	18	3	—
34	do	211	F	32.0	.....	.727	62.6	25	6	—
35	do	87	S	29.0	.....	.780	49.5	25	2	—
36	Chicago	259	G	23.0	.....	.839	36.9	25	6	—

[1] In this column D means "distributing station"; F, "filling station"; G, "garage"; R, "refinery"; S, "service station."

[2] Negative doctor tests are reported thus, —.

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marketed in January, 1920.

Distillation range.[3]												Recovery (per cent).	Distillation loss (per cent).	Sample No.
Initial boiling point.	10 per cent.	20 per cent.	30 per cent.	40 per cent.	50 per cent.	60 per cent.	70 per cent.	80 per cent.	90 per cent.	End point.	Average boiling point.			
106	174	181	221	237	253	270	289	311	343	388	252	97.5	1.1	1
41	79	83	105	114	123	132	143	155	173	198	122			
127	194	216	232	246	264	280	297	318	354	419	268	97.0	1.8	2
53	90	102	111	119	129	138	147	159	179	215	131			
131	187	212	234	252	268	284	306	329	365	430	273	97.0	1.6	3
55	86	100	112	122	131	140	152	165	185	221	134			
118	174	201	223	241	255	273	291	306	343	399	257	97.7	1.0	4
48	79	94	106	116	124	134	144	152	173	204	125			
140	183	201	219	232	246	259	282	313	367	477	266	97.0	1.5	5
60	84	94	104	111	119	126	139	156	186	247	130			
124	181	216	232	246	266	284	302	333	379	426	271	97.2	1.7	6
51	83	102	111	119	130	140	150	167	193	219	133			
111	174	203	223	241	257	277	295	318	356	401	261	97.0	1.6	7
44	79	95	106	116	125	136	146	159	180	206	127			
111	172	198	217	234	246	270	289	313	347	397	253	97.0	1.8	8
44	78	92	103	112	119	132	143	156	175	203	123			
124	180	198	210	225	234	246	262	286	325	412	246	97.0	1.5	9
51	82	92	99	107	112	119	128	141	163	211	119			
122	187	212	230	248	266	284	306	327	363	430	270	97.5	1.3	10
50	86	100	110	120	130	140	152	164	184	221	132			
106	180	212	226	253	282	293	320	351	390	442	279	96.5	2.1	11
41	82	100	108	123	139	145	160	177	199	228	137			
86	136	174	208	234	253	271	293	322	374	412	252	93.3	5.5	12
30	58	79	98	112	123	133	145	161	190	211	122			
124	185	221	250	271	300	313	329	352	383	437	288	97.2	1.3	13
51	85	105	121	133	149	156	165	178	195	225	142			
138	194	221	246	255	286	304	324	347	381	435	284	97.7	1.1	14
59	90	105	119	124	141	151	162	175	194	224	140			
133	189	212	230	248	264	280	297	320	352	412	268	97.6	1.2	15
56	87	100	110	120	129	138	147	160	178	211	131			
133	192	217	237	257	277	297	318	343	376	439	280	97.7	1.1	16
56	89	103	114	125	136	147	159	173	191	226	138			
126	187	207	226	244	262	280	298	322	352	406	264	98.0	.8	17
52	86	97	108	118	128	138	148	161	178	208	129			
122	192	223	246	266	288	306	333	352	388	439	288	97.2	1.7	18
50	89	106	119	130	142	152	167	178	198	226	142			
140	154	158	162	165	167	228	244	291	408	482	237	97.2	1.0	19
60	68	70	72	74	75	109	118	144	209	250	114			
140	154	158	162	165	167	228	246	291	408	489	237	97.2	1.4	20
60	68	70	72	74	75	109	119	144	209	254	114			
111	165	196	219	237	257	273	295	316	367	423	261	97.0	1.6	21
44	74	91	104	114	125	134	146	158	186	217	127			
95	144	180	212	228	262	286	309	336	379	426	261	95.0	3.8	22
35	62	82	100	109	128	141	154	169	193	219	127			
122	185	212	230	248	266	284	302	327	361	423	270	97.2	1.4	23
50	85	100	110	120	130	140	150	164	183	217	132			
91	124	147	172	198	226	253	286	333	408	437	243	92.5	6.1	24
33	51	64	78	92	108	123	141	167	209	225	117			
77	126	194	255	280	309	327	349	383	.....	462	277	88.0	10.4	25
25	52	90	124	138	154	164	176	195	.....	239	136			
93	122	142	158	190	212	235	262	302	369	415	228	94.0	4.4	26
34	50	61	70	88	100	113	128	150	187	213	109			
117	172	203	226	244	261	273	289	311	343	399	259	97.0	1.8	27
47	78	95	108	118	127	134	143	155	173	204	126			
88	129	154	176	199	219	239	261	291	338	415	228	95.5	3.3	28
31	54	68	80	93	104	115	127	144	170	213	109			
95	140	167	190	212	235	255	280	306	349	401	239	96.0	2.6	29
35	60	75	88	100	113	124	138	152	176	205	115			
100	154	217	273	293	309	316	338	358	394	446	291	94.8	3.8	30
38	68	103	134	145	154	158	170	181	201	230	144			
95	147	183	219	250	279	289	329	358	401	428	271	95.0	3.8	31
35	64	84	104	121	137	143	165	181	205	220	133			
93	131	171	199	221	244	270	297	331	390	408	250	92.5	6.3	32
34	55	77	93	105	118	132	147	166	199	209	121			
118	171	199	217	237	253	275	297	320	352	401	259	97.5	1.3	33
48	77	93	103	114	123	135	147	160	188	205	126			
99	138	167	196	225	252	284	307	347	401	446	261	95.0	3.6	34
37	59	75	91	107	122	140	153	175	205	230	127			
115	171	198	217	235	264	297	333	361	399	444	275	96.0	2.6	35
46	77	92	103	113	129	147	167	183	204	229	135			
169	181	185	187	192	198	210	237	307	360	484	246	98.0	.8	36
76	83	85	86	89	92	99	114	153	182	251	119			

[3] For each sample the upper line shows results in degrees Fahrenheit; the lower, in degrees centigrade.

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TABLE 2.—*Analyses of gasolines*

Sample No.	City.	Company No.	Sample collected from—	Price (cents per gallon).		Gravity at 60° F.		Color, Saybolt.	Unsaturation (per cent).	Doctor test.
				Retail.	Tank wagon.	Specific gravity.	Baumé.			
37	Chicago	3	F	24.0	23.0	0.745	57.9	25	12	—
38	do	1	G	24.0	22.5	.742	58.7	25	2	—
39	do	208	F	24.0	22.0	.805	43.9	25	6	—
40	do	260	F	26.0	22.0	.739	59.4	25	2	—
41	do	260	G	26.0	22.0	.736	60.2	25	2	—
42	do	4	F	24.0	22.0	.749	56.9	25	4	—
43	do	175	F	24.0	22.0	.748	57.2	25	8	—
44	do	206	G	24.0	22.0	.749	56.9	25	4	—
45	do	4	G	25.0	22.0	.749	56.9	25	3	—
46	do	131	G	25.0	22.0	.749	56.9	25	10	—
47	do	3	F	24.0	22.0	.749	56.9	25	9	—
48	do	1	F	24.0	22.0	.751	56.4	25	2	—
49	do	1	G	24.0	22.0	.743	58.4	25	2	—
50	do	208	S	25.0	22.0	.753	55.9	25	2	—
51	New Orleans	56	F	26.0	24.0	.742	58.7	25	2	—
52	do	17	F	26.0	24.0	.744	58.2	25	8	—
53	do	172	S	26.0	24.0	.742	58.7	25	1	—
54	do	172	S	34.0	32.0	.728	62.3	25	6	—
55	do	1	S	26.0	24.0	.747	57.4	18	2	—
56	do	2	F	26.0	24.0	.747	57.4	25	3	—
57	do	1	F	26.0	24.0	.747	57.4	25	2	—
58	do	188	F	26.0	24.0	.741	58.9	25	2	—
59	Salt Lake City	81	G	28.0	.....	.757	54.9	25	6	—
60	do	121	S	33.0	.....	.746	57.7	25	1	—
61	do	258	D	29.0	.....	.748	57.2	25	2	—
62	do	81	S	28.5	.....	.755	55.4	25	6	—
63	do	81	D	27.5	26.5	.752	56.2	25	10	—
64	do	81	R	27.5	26.5	.748	57.1	25	6	—
65	do	81	R	27.5	26.5	.735	60.5	25	8	—
66	do	81	D	28.5	26.5	.752	56.2	25	8	—
67	San Francisco	14	F	21.5	.....	.755	55.4	25	2	—
68	do	19	G	21.5	.....	.764	53.2	25	2	—
69	do	16	S	21.5	.....	.763	53.5	25	2	—
70	do	13	S	21.5	.....	.762	53.7	25	2	—
71	do	19	S	14.5	.....	.805	43.9	18	1	—
72	do	16	G	21.5	.....	.763	53.5	25	2	—
73	do	16	S	.....	.....	.812	42.4	25	2	—
74	do	13	G	21.5	.....	.761	54.0	25	2	—

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marketed in January, 1920—Continued.

Distillation range.												Recovery (per cent).	Distillation loss (per cent).	Sample No.
Initial boiling point.	10 per cent.	20 per cent.	30 per cent.	40 per cent.	50 per cent.	60 per cent.	70 per cent.	80 per cent.	90 per cent.	End point.	Average boiling point.			
108	172	212	239	255	286	304	322	345	385	442	279	96.2	2.6	37
42	78	100	115	124	141	151	161	174	196	228	137			
102	158	192	216	239	262	286	306	338	383	435	266	96.5	2.1	38
39	70	89	102	115	128	141	152	170	195	224	130			
147	187	194	201	208	216	241	255	273	291	387	237	98.0	.4	39
64	86	90	94	98	102	116	124	134	144	197	114			
95	135	160	194	228	266	302	334	376	442	477	273	92.0	6.7	40
35	57	71	90	109	130	150	168	191	228	247	134			
102	140	174	214	252	286	318	345	381	441	489	286	94.0	4.6	41
39	60	79	101	122	141	159	174	194	227	254	141			
127	180	210	232	252	271	293	315	338	374	432	275	97.0	1.6	42
53	82	99	111	122	133	145	157	170	190	222	135			
108	172	210	239	266	284	304	325	345	383	442	280	96.0	2.6	43
42	78	99	115	130	140	151	163	174	195	228	138			
133	181	214	237	255	275	297	320	345	383	439	280	97.0	1.4	44
56	83	101	114	124	135	147	160	174	195	226	138			
113	176	210	234	252	275	297	316	342	379	437	275	97.0	1.8	45
45	80	99	112	122	135	147	158	172	193	225	135			
104	176	214	239	257	277	297	316	342	381	437	277	96.5	2.3	46
40	80	101	115	125	136	147	158	172	194	225	136			
97	172	208	239	255	273	297	316	340	381	428	273	95.5	3.3	47
36	78	98	115	124	134	147	158	171	194	220	134			
118	176	205	230	250	273	298	322	363	410	473	284	97.0	1.4	48
48	80	96	110	121	134	148	161	184	210	245	140			
104	165	192	212	230	250	275	306	336	385	451	264	97.0	1.6	49
40	74	89	100	110	121	135	152	169	196	233	129			
118	176	205	217	228	239	253	273	298	338	414	252	97.0	1.6	50
48	80	96	103	109	115	123	134	148	170	212	122			
118	169	196	217	237	255	275	297	325	361	423	261	97.0	1.6	51
48	76	91	103	114	124	135	147	163	183	217	127			
118	181	214	235	255	275	293	311	336	372	441	275	97.0	1.6	52
48	83	101	113	124	135	145	155	169	189	227	135			
124	174	199	217	234	252	273	297	324	361	414	261	97.5	.9	53
51	79	93	103	112	122	134	147	162	183	212	127			
140	167	183	192	203	212	226	241	261	291	385	228	98.0	.8	54
60	75	84	89	95	100	108	116	127	144	196	109			
127	180	207	226	244	264	282	304	327	360	424	268	97.5	1.2	55
53	82	97	108	118	129	139	151	164	182	218	131			
127	190	210	226	243	261	279	293	327	363	433	268	97.7	.9	56
53	88	97	108	117	127	137	145	164	184	223	131			
131	190	216	234	252	270	284	304	329	363	428	273	97.5	1.3	57
55	88	102	112	122	132	140	151	165	184	220	134			
144	189	217	234	255	273	291	309	331	365	446	277	97.7	.9	58
62	87	103	112	124	134	144	154	166	185	230	136			
100	163	196	212	243	270	298	327	361	392	448	273	97.0	1.8	59
38	73	91	100	117	132	148	164	183	200	231	134			
136	192	212	230	246	262	284	302	329	383	423	273	97.5	1.3	60
58	89	100	110	119	128	140	150	165	195	217	134			
135	185	207	226	237	252	277	302	329	376	453	271	97.5	1.5	61
57	85	97	108	114	122	136	150	165	191	234	133			
104	172	226	237	259	282	306	334	383	406	448	288	97.0	2.0	62
40	78	108	114	126	139	152	168	195	208	231	142			
109	176	208	219	259	282	306	334	365	406	450	284	97.0	2.3	63
43	80	98	104	126	139	152	168	185	208	232	140			
122	169	201	225	244	257	291	316	343	381	444	271	97.5	1.5	64
50	76	94	107	118	125	144	158	173	194	229	133			
100	158	178	208	226	239	257	275	297	331	401	243	96.5	2.5	65
38	70	81	98	108	115	125	135	147	166	205	117			
102	174	207	234	257	282	307	336	356	410	453	284	96.5	2.1	66
39	79	97	112	125	139	153	169	180	210	234	140			
127	187	208	226	243	257	273	291	311	349	419	262	97.0	1.8	67
53	86	98	108	117	125	134	144	155	176	215	128			
113	181	216	237	255	271	288	304	325	360	424	270	97.0	2.2	68
45	83	102	114	124	133	142	151	163	182	218	132			
111	171	205	228	246	266	284	302	324	369	405	264	97.0	1.8	69
44	77	96	109	119	130	140	150	162	187	207	129			
135	190	212	228	243	253	270	286	302	336	401	259	98.0	.8	70
57	88	100	109	117	123	132	141	150	169	205	126			
207	266	289	300	313	324	336	351	369	401	464	329	97.5	1.1	71
97	130	143	149	156	162	169	177	187	205	240	165			
111	180	216	239	255	273	288	304	327	358	414	270	97.0	1.9	72
44	82	102	115	124	134	142	151	164	181	212	132			
221	286	300	316	324	343	358	376	397	428	498	351	98.0	.8	73
105	141	149	158	162	173	181	191	203	220	259	177			
126	180	210	226	239	255	270	286	304	336	410	259	97.8	1.0	74
52	82	99	108	115	124	132	141	151	169	210	126			

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TABLE 2.—*Analyses of gasolines*

Sample No.	City.	Company No.	Sample collected from [1]—	Price (cents per gallon).		Gravity at 60° F.		Color, Saybolt.	Unsaturation (per cent).	Doctor test.[2]
				Retail.	Tank wagon.	Specific gravity.	Baumé.			
75	San Francisco.....	14	G.....	21.5	.....	0.758	54.7	25	2	—
76	.....do.....	19	S.....	21.5	.....	.753	55.9	25	2	—
77	.....do.....	14	D.....	49.5	.....	.676	77.1	25	3	—
78	.....do.....	13	S.....	21.5	.....	.762	53.7	25	2	—
79	.....do.....	14	S.....	21.5	.....	.749	56.9	25	2	—
80	.....do.....	16	S.....	21.5	.....	.762	53.7	25	1	—
81	.....do.....	19	S.....	21.5	.....	.751	56.4	25	2	—

[1] In this column D means "distributing station"; F, "filling station"; G, "garage"; R, "refinery"; and S, "service station."
[2] Negative doctor tests are reported thus, —.

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marketed in January, 1920—Continued.

Distillation range.[1]											Average boiling point.	Recovery (per cent).	Distillation loss (per cent).	Sample No.
Initial boiling point.	10 per cent.	20 per cent.	30 per cent.	40 per cent.	50 per cent.	60 per cent.	70 per cent.	80 per cent.	90 per cent.	End point.				
124	181	203	219	232	246	261	297	302	334	397	253	97.5	1.3	75
51	83	95	104	111	119	127	147	150	168	203	123			
113	172	198	214	228	239	255	268	291	334	394	246	96.5	2.0	76
45	78	92	101	109	115	124	131	144	168	201	119			
91	104	113	126	138	153	165	183	203	250	286	165	92.0	6.8	77
33	40	45	52	59	67	74	84	95	121	141	74			
126	183	210	226	232	255	268	286	304	336	399	257	97.5	1.3	78
52	84	99	108	111	124	131	141	151	169	204	125			
118	172	196	214	228	243	257	275	297	333	394	248	97.0	1.8	79
48	78	91	101	109	117	125	135	147	167	201	120			
113	176	207	228	248	264	282	298	320	347	406	262	97.5	1.3	80
45	80	97	109	120	129	139	148	160	175	208	128			
113	165	190	207	219	232	246	259	280	324	383	237	97.5	1.3	81
45	74	88	97	104	111	119	126	138	162	195	114			

[1] For each sample the upper line shows results in degrees Fahrenheit; the lower, in degrees centigrade.

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TABLE 3.—*Analyses of gasolines*

Sample No.	City.	Company No.	Sample collected from [1]—	Price (cents per gallon).		Gravity at 60° F.		Color, Saybolt.	Unsaturation (per cent).	Doctor test.[2]
				Retail.	Tank wagon.	Specific gravity.	Baumé.			
82	New York	2	F	33.0	30.5	0.741	58.9	18	1	+
83	do	1	F	33.0	30.5	.747	57.4	22	2	−
84	do	6	S	33.0	30.5	.754	55.7	20	1	−
85	do	5	F	34.0	30.5	.745	57.9	20	4	−
86	do	2	G	34.0	30.5	.744	58.2	21	1	−
87	do	211	G	34.0	30.5	.744	58.2	21	2	+
88	do	5	F	34.0	31.0	.743	58.4	22	4	+
89	do	1	F	33.0	31.0	.746	57.7	22	2	−
90	do	21	F	34.0	31.0	.741	58.9	17	4	−
91	do	261	F	33.0	30.5	.741	58.9	20	2	−
92	do	21	G	35.0	30.5	.742	58.7	21	5	−
93	Washington	7	F	31.0	28.5	.740	59.2	16	4	+
94	do	1	F	31.0	28.5	.743	58.4	20	3	−
95	do	7	D	31.0	28.5	.740	59.2	23	4	+
96	do	252	F	37.0	.....	.816	41.6	Below 10	34	+
97	do	199	F	33.0	.....	.743	58.4	25	4	+
98	do	199	F	30.0	28.5	.738	59.7	23	2	+
99	do	116	D	38.0	35.0	.712	66.6	21	2	−
100	do	116	D	31.0	28.5	.748	57.2	24	4	−
101	do	199	D	31.0	28.5	.728	62.3	22	3	+
102	do	1	F	31.0	28.5	.742	58.7	23	1	−
103	do	116	G	31.0	28.5	.744	58.2	22	3	−
104	do	199	D	31.0	28.5	.746	57.7	19	4	−
105	do	262	F	29.5	28.5	.744	58.2	24	2	+
106	Pittsburgh	87	F	33.0	31.0	.727	62.6	21	1	−
107	do	87	F	36.0	34.0	.716	65.5	21	2	−
108	do	18	F	33.0	31.0	.744	58.2	19	3	+
109	do	18	F	36.0	34.0	.709	67.5	21	4	+
110	do	251	S	33.0	.....	.772	51.3	16	5	−
111	do	211	F	33.0	31.0	.740	59.2	19	2	+
112	do	211	F	36.0	34.0	.736	60.2	21	2	+
113	do	2	F	33.0	31.0	.735	60.5	18	2	+
114	do	20	F	33.0	31.0	.730	61.8	17	3	+
115	do	20	F	36.0	34.0	.713	66.4	23	1	−
116	do	61	F	34.0	32.0	.729	62.0	21	3	+

[1] In this column F means "filling station"; G, "garage"; D, "distributing station"; S, "service station"; and R, "refinery."

[2] Negative doctor tests are reported thus, −; positive tests are reported thus, +.

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marketed in July, 1920.

Distillation range.[3]											Average boiling point.	Recovery (per cent).	Distillation loss (per cent).	Sample No.
Initial boiling point.	10 per cent.	20 per cent.	30 per cent.	40 per cent.	50 per cent.	60 per cent.	70 per cent.	80 per cent.	90 per cent.	End point.				
126	172	192	208	226	244	266	288	318	367	441	259	96.5	2.1	82
52	78	89	98	108	118	130	142	159	186	227	126			
122	185	208	230	246	261	275	302	329	369	432	270	97.0	1.7	83
50	85	98	110	119	127	135	150	165	187	222	132			
149	205	214	237	252	271	291	315	345	390	460	284	97.5	1.2	84
65	96	101	114	122	133	144	157	174	199	238	140			
135	201	226	243	261	268	291	309	329	361	428	277	98.0	.7	85
57	94	108	117	127	131	144	154	165	183	220	136			
138	172	198	216	221	237	259	284	311	356	437	257	97.0	1.6	86
59	78	92	102	105	114	126	140	155	180	225	125			
108	165	207	244	271	288	313	336	363	408	432	286	95.0	4.1	87
42	74	97	118	133	142	156	169	184	209	222	141			
138	192	219	239	255	271	288	304	325	378	419	275	97.4	1.4	88
59	89	104	115	124	133	142	151	163	192	215	135			
122	180	207	226	246	264	282	304	329	369	426	268	97.0	1.6	89
50	82	97	108	119	129	139	151	165	187	219	131			
142	192	210	228	246	264	282	304	327	381	423	273	97.0	1.8	90
61	89	99	109	119	129	139	151	164	194	217	134			
140	201	212	228	246	264	284	309	333	370	435	275	97.0	1.8	91
60	94	100	109	119	129	140	154	167	188	224	135			
133	189	212	230	248	264	284	304	327	361	414	270	97.5	1.3	92
56	87	100	110	120	129	140	151	164	183	212	132			
122	180	207	232	253	271	293	315	340	384	442	277	96.0	2.8	93
50	82	97	111	123	133	145	157	171	194	228	136			
127	187	214	234	250	266	270	304	327	367	424	270	96.8	2.0	94
53	86	101	112	121	130	132	151	164	186	218	132			
122	174	203	228	248	268	291	304	334	376	439	271	97.0	1.8	95
50	79	95	109	120	131	144	151	168	191	226	133			
145	151	154	156	160	162	178	230	327	415	498	234	97.5	1.1	96
63	66	68	69	71	72	81	110	164	213	259	112			
109	156	187	214	244	279	304	343	372	410	450	279	95.0	3.6	97
43	69	86	101	118	137	151	173	189	210	232	137			
115	162	194	228	261	289	324	349	376	408	453	288	96.0	2.8	98
46	72	90	109	127	143	162	176	191	209	234	142			
99	120	149	174	216	291	340	367	388	423	448	273	93.5	5.3	99
37	49	65	79	102	144	171	186	198	217	231	134			
160	198	232	252	273	293	315	340	381	397	455	300	98.0	.8	100
71	92	111	122	134	145	157	171	194	203	235	149			
127	151	180	212	257	298	329	351	383	414	451	286	95.0	3.8	101
53	66	82	100	125	148	165	177	195	212	233	141			
144	187	216	234	250	266	284	304	327	381	437	275	97.0	1.9	102
62	86	102	112	121	130	140	151	164	194	225	135			
147	196	214	252	273	293	315	338	365	397	415	295	97.4	1.4	103
64	91	101	122	134	145	157	170	185	203	230	146			
135	181	223	248	275	297	313	345	367	408	453	295	97.0	1.8	104
57	83	106	120	135	147	156	174	186	209	234	146			
149	203	225	234	259	277	297	315	340	374	437	282	97.5	1.7	105
65	95	107	112	126	136	147	157	171	190	225	139			
147	185	205	223	239	255	273	293	318	340	399	262	97.6	1.2	106
64	85	96	106	115	124	134	145	159	171	204	128			
129	162	181	199	216	232	250	271	298	338	392	243	97.3	1.7	107
54	72	83	93	102	111	121	133	148	170	200	117			
142	196	221	243	261	279	298	318	342	376	439	282	97.0	1.8	108
61	91	105	117	127	137	148	159	172	191	226	139			
106	127	149	176	208	232	275	311	347	414	437	253	92.5	6.3	109
41	53	65	80	98	111	135	155	175	212	225	123			
106	149	169	185	201	219	255	322	392	455	518	270	95.0	3.2	110
41	65	76	85	94	104	124	161	200	235	270	132			
135	181	208	230	252	270	289	313	336	378	437	275	96.4	2.6	111
57	83	98	110	122	132	143	156	169	192	225	135			
120	169	196	221	243	264	286	311	342	381	448	271	97.0	1.8	112
49	76	91	105	117	129	141	155	172	194	231	133			
127	181	198	230	246	264	282	307	334	385	460	275	97.0	1.6	113
53	83	92	110	119	129	139	153	168	196	238	135			
109	192	210	223	234	248	266	284	313	360	424	261	97.6	1.4	114
43	89	99	106	112	120	130	140	156	182	218	127			
131	158	176	192	203	210	234	282	329	374	401	244	90.0	8.8	115
55	70	80	89	95	99	112	139	165	190	205	118			
133	172	199	223	246	266	291	318	347	394	475	279	97.0	1.8	116
56	78	93	106	119	130	144	159	175	201	246	137			

[3] For each sample the upper line shows results in degrees Fahrenheit and the lower line in degrees centigrade.

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TABLE 3.—*Analyses of gasolines*

Sample No.	City.	Company No.	Sample collected from—	Price (cents per gallon).		Gravity at 60° F.		Color, Saybolt.	Unsaturation (per cent).	Doctor test.
				Retail.	Tank wagon.	Specific gravity.	Baumé.			
117	Pittsburgh	61	F	36.0	35.0	0.734	60.7	18	2	+
118	do	165	F	33.0	31.0	.739	59.4	10	3	−
119	do	165	F	36.0	34.0	.738	59.7	2	3	+
120	Chicago	80	G	28.0	26.0	.744	58.2	23	1	−
121	do	263	G	30.0		.798	45.4	17	3	+
122	do	263	G	29.0		.753	55.9	18	2	+
123	do	1	G	28.0	26.0	.747	57.4	20	1	−
124	do	3	F	28.0	26.0	.751	56.4	19	7	−
125	do	259	G	28.0		.854	33.9	20	3	+
126	do	260	F	30.0	28.0	.745	57.9	18	1	+
127	do	131	G	28.0	26.0	.729	62.0	19	5	−
128	do	4	F	28.0	26.0	.754	55.7	18	2	−
129	New Orleans	56	F	28.0	26.0	.745	57.9	19	1	−
130	do	17	F	28.0	26.0	.745	57.9	17	5	+
131	do	4	F	28.0	26.0	.761	54.0	17	4	−
132	do	1	S	28.0	26.0	.745	57.9	19	2	−
133	do	2	F	28.0	26.0	.740	59.2	19	3	−
134	do	1	F	28.0	26.0	.747	57.4	19	3	−
135	do	264	F	28.0	26.0	.750	56.7	20	6	−
136	do	188	F	28.0	26.0	.745	57.9	20	Trace.	−
137	Salt Lake	81	R	33.5		.765	53.0	20	5	+
138	do	81	R	33.5		.765	53.0	22	5	+
139	do	81	F	33.0		.762	53.7	21	5	+
140	do	81	D	32.0	31.0	.760	54.2	23	4	+
141	do	81	D	32.0	31.0	.761	54.0	24	5	+
142	do	258	D	32.0	31.0	.752	56.2	23	11	−
143	do	258	D	37.0	36.0	.726	62.8	25	7	−
144	do	258	D	32.0	31.0	.753	55.9	22	10	−
145	do	121	F	39.0		.729	62.0	24	7	−
146	do	81	S	37.0		.765	53.0	−6	5	+
147	do	81	D	33.0	31.0	.764	53.2	24	4	+
148	do	81	S	33.0		.763	53.5	25	5	+
149	San Francisco	13	S	23.5		.762	53.7	20	1	+
150	do	14	S	23.5		.762	53.7	18	1	+
151	do	16	S	23.5		.770	51.8	18	1	+
152	do	19	S	23.5		.757	54.9	16	1	+
153	do	16	G	23.5		.769	52.1	18	Trace.	−

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marketed in July, 1920—Continued.

Distillation range.											Average boiling point.	Recovery (per cent).	Distillation loss (per cent).	Sample No.
Initial boiling point.	10 per cent.	20 per cent.	30 per cent.	40 per cent.	50 per cent.	60 per cent.	70 per cent.	80 per cent.	90 per cent.	End point.				
122	163	201	232	259	284	307	331	363	414	495	288	97.0	1.8	117
50	73	94	111	126	140	153	166	184	212	257	142			
138	156	230	293	318	336	354	376	410	493	[a]518	329	92.0	2.0	118
59	69	110	145	159	169	179	191	210	256	[a]270	165			
142	158	201	255	298	320	349	374	410	491	[a]518	320	94.0	2.0	119
61	70	94	124	148	160	176	190	210	255	[a]270	160			
145	190	208	225	239	255	275	300	324	372	453	271	97.0	1.8	120
63	88	98	107	115	124	135	149	162	189	234	133			
151	183	190	199	207	217	234	262	309	372	446	252	97.2	1.8	121
66	84	88	93	97	103	112	128	154	189	230	122			
144	194	217	235	253	271	295	322	360	399	462	286	97.0	2.0	122
62	90	103	113	123	133	146	161	182	204	239	141			
151	183	210	232	250	271	291	318	345	387	466	282	97.5	1.5	123
66	84	99	111	121	133	144	159	174	197	241	139			
127	189	214	246	266	282	300	324	345	383	432	282	97.0	1.8	124
53	87	101	119	130	139	149	162	174	195	222	139			
176	176	176	189	194	203	226	340	412	450	482	275	97.0	1.8	125
80	80	80	87	90	95	108	171	211	232	250	135			
156	167	212	234	248	262	277	298	316	352	428	268	97.2	1.6	126
69	75	100	112	120	128	136	148	158	178	220	131			
95	135	169	208	250	284	318	351	383	435	464	280	92.0	6.5	127
35	57	76	98	121	140	159	177	195	224	240	138			
135	203	228	248	268	288	309	333	361	441	464	298	96.5	2.5	128
57	95	109	120	131	142	154	167	183	227	240	148			
147	192	212	228	248	270	289	311	334	370	423	275	98.0	.8	129
64	89	100	109	120	132	143	155	168	188	217	135			
118	189	223	246	264	288	306	329	352	397	446	288	96.0	2.6	130
48	87	106	119	129	142	152	165	178	203	230	142			
151	219	241	259	277	295	313	331	354	388	462	298	97.5	1.1	131
66	104	116	126	136	146	156	166	179	198	239	148			
127	190	216	234	252	270	289	307	331	361	428	273	98.0	1.0	132
53	88	102	112	122	132	143	153	166	183	220	134			
127	183	203	221	237	257	275	293	327	372	444	268	96.0	3.0	133
53	84	95	105	114	125	135	145	164	189	229	131			
136	201	221	239	255	275	293	313	334	369	432	279	97.5	1.3	134
58	94	105	115	124	135	145	156	168	187	222	137			
145	203	228	250	271	297	320	351	385	442	509	309	96.5	2.1	135
63	95	109	121	133	147	160	177	196	228	265	154			
135	212	241	259	275	289	304	318	334	363	412	286	97.0	2.0	136
57	100	116	126	135	143	151	159	168	184	211	141			
131	194	230	252	271	293	325	356	378	414	459	300	97.0	1.8	137
55	90	110	122	133	145	163	180	192	212	237	149			
129	198	228	250	275	298	320	349	378	414	459	300	96.6	2.1	138
54	92	109	121	135	148	160	176	192	212	237	149			
140	190	223	246	266	293	306	345	369	406	450	295	97.0	1.8	139
60	88	106	119	130	145	152	174	187	208	232	146			
117	185	208	235	259	284	309	340	365	406	453	288	97.5	1.5	140
47	85	98	113	126	140	154	171	185	208	234	142			
124	190	219	241	262	286	309	333	363	399	451	289	97.5	1.3	141
51	88	104	116	128	141	154	167	184	204	233	143			
136	190	219	244	268	291	307	340	369	408	460	295	98.0	.9	142
58	88	104	118	131	144	153	171	187	209	238	146			
113	147	165	183	203	221	248	280	322	385	457	248	96.5	2.2	143
45	64	74	84	95	105	120	138	161	196	236	120			
133	190	219	244	266	291	315	340	374	414	471	297	97.0	1.8	144
56	88	104	118	130	144	157	171	190	212	244	147			
113	149	172	190	208	230	255	284	333	401	464	255	96.5	2.3	145
45	65	78	88	98	110	124	140	167	205	240	124			
127	194	221	250	271	291	313	338	374	408	450	295	97.5	1.3	146
53	90	105	121	133	144	156	170	190	209	232	146			
129	196	221	244	266	288	306	338	369	406	450	291	97.0	1.6	147
54	91	105	118	130	142	152	170	187	208	232	144			
120	189	217	243	262	289	307	338	370	406	450	289	97.0	1.8	148
49	87	103	117	128	143	153	170	188	208	232	143			
133	196	216	232	248	264	282	300	325	361	424	271	97.0	1.8	149
56	91	102	111	120	129	139	149	163	183	218	133			
131	192	214	232	246	262	277	297	320	361	428	270	96.5	2.1	150
55	89	101	111	119	128	136	147	160	183	220	132			
113	190	226	250	270	288	306	333	352	392	441	288	96.5	2.1	151
45	88	108	121	132	142	152	167	178	200	227	142			
120	178	199	216	230	243	261	280	306	343	415	253	97.0	1.6	152
49	81	93	102	110	117	127	138	152	173	213	123			
109	183	221	245	266	284	309	331	351	388	441	284	97.0	1.8	153
43	84	105	119	130	140	154	166	177	198	227	140			

[a] Upper limit of thermometer.

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TABLE 3.—*Analyses of gasolines*

Sample No.	City.	Company No.	Sample collected from[1]—	Price (cents per gallon).		Gravity at 60° F.		Color, Saybolt.	Unsaturation (per cent).	Doctor test.[2]
				Retail.	Tank wagon.	Specific gravity.	Baumé.			
154	San Francisco.....	19	G.....	23.5	.....	0.755	55.4	17	Trace.	—
155	.....do.....	19	F.....	23.5	.....	.755	55.4	16	1	—
156	.....do.....	13	F.....	23.5	.....	.761	54.0	17	1	+
157	.....do.....	16	F.....	23.5	.....	.771	51.6	20	1	—
158	.....do.....	14	G.....	23.5	.....	.762	53.7	18	2	+
159	.....do.....	14	D.....	23.5	.....	.761	54.0	16	1	+
160	.....do.....	13	G.....	23.5	.....	.761	54.0	17	1	+
161	.....do.....	19	F.....	23.5	.....	.754	55.7	16	1	—
162	.....do.....	16	F.....	23.5	.....	.770	51.8	21	Trace.	—
163	.....do.....	13	D.....	23.5	.....	.762	53.7	19	2	+

[1] In this column D means "distributing station"; F, "filling station"; G, "garage"; R, "refinery"; and S, "service station."

[2] Negative doctor tests are reported thus, —; positive tests thus, +.

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marketed in July, 1920—Continued.

Distillation range.[3]											Average boiling point.	Recovery (per cent).	Distillation loss (per cent).	Sample No.
Initial boiling point.	10 per cent.	20 per cent.	30 per cent.	40 per cent.	50 per cent.	60 per cent.	70 per cent.	80 per cent.	90 per cent.	End point.				
118	176	198	214	228	243	257	277	300	338	410	252	97.5	1.3	154
48	80	92	101	109	117	125	136	149	170	210	122			
120	171	192	212	226	243	259	275	297	333	403	248	97.0	1.8	155
49	77	89	100	108	117	126	135	147	167	206	120			
136	198	217	234	246	262	280	300	325	360	423	271	97.0	2.0	156
58	92	103	112	119	128	138	149	163	182	217	133			
111	192	228	248	268	284	306	325	356	388	441	286	96.5	2.3	157
44	89	109	120	131	140	152	163	180	198	227	141			
124	192	217	234	246	262	279	297	320	358	435	270	97.0	1.8	158
51	89	103	112	119	128	137	147	160	181	224	132			
129	192	216	234	250	262	279	297	318	358	437	270	97.5	1.5	159
54	89	102	112	121	128	137	147	159	181	225	132			
136	201	221	235	250	266	286	304	327	368	428	275	97.0	2.0	160
58	94	105	113	121	130	141	151	164	184	220	135			
118	174	199	216	228	243	257	280	309	338	421	253	97.5	1.5	161
48	79	93	102	109	117	125	138	154	170	216	123			
118	187	226	252	270	289	311	327	356	392	446	289	97.0	2.0	162
48	86	108	122	132	143	155	164	180	200	230	143			
144	207	225	239	253	268	282	300	325	361	430	275	97.5	1.5	163
62	97	107	115	123	131	139	149	163	183	221	135			

[3] For each sample the upper line shows results in degrees Fahrenheit; the lower, in degrees centigrade.

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TABLE 4.—*Analyses of gasolines*

Sample No.	City.	Company No.	Sample collected from [1]	Price (cents per gallon).		Gravity at 60° F.		Color, Saybolt.	Unsaturation (per cent).	Doctor test.[2]
				Retail.	Tank wagon.	Specific gravity.	Baumé.			
164	New York	5	F	35.0	31.0	0.741	58.9	24	5.0	+
165	do	2	G	35.0	31.0	.730	61.8	24	2.0	+
166	do	211	G	35.0	31.0	.735	60.5	20	2.0	+
167	do	21	G	36.0	31.5	.742	58.7	24	4.0	−
168	do	5	F	35.0	31.0	.741	58.9	21	4.0	+
169	do	21	G	35.0	31.5	.741	58.9	25	5.0	−
170	do	6	G	34.0	30.0	.751	56.4	22	3.0	−
171	do	1	F	34.0	30.0	.753	55.9	19	2.0	−
172	do	2	F	34.0	30.0	.730	61.8	24	2.0	+
173	do	1	F	34.0	30.0	.752	56.2	20	4.0	−
174	do	5	F	35.0	31.0	.741	58.9	25	4.0	+
175	do	21	F	35.0	31.5	.740	59.2	25	4.0	−
176	do	5	G	35.0	31.0	.740	59.2	25	4.0	+
177	do	1	F	34.0	30.0	.756	55.2	16	4.0	−
178	Washington	199	F	30.0	.....	.742	58.7	14	4.0	+
179	do	7	F	31.0	28.5	.742	58.7	21	3.0	+
180	do	1	F	31.0	28.5	.743	58.4	22	3.0	+
181	do	116	G	31.0	28.5	.742	58.7	22	4.0	+
182	do	252	G	38.0	34.0	.818	41.1	16	34.0	+
183	do	262	F	30.0	.....	.736	60.2	22	6.0	+
184	do	199	F	33.0	30.0	.778	49.9	24	4.0	+
185	do	199	F	30.0	28.5	.731	61.5	21	3.0	+
186	do	7	D	31.0	28.5	.742	58.7	23	3.0	+
187	do	1	D	31.0	28.5	.751	56.4	22	3.0	−
188	Pittsburgh	251	F	33.0	31.0	.800	45.0	20	2.0	−
189	do	251	F	36.0	34.0	.700	70.0	23	6.0	−
190	do	87	D	33.0	31.0	.730	61.8	+25	2.0	+
191	do	211	F	33.0	31.0	.740	59.2	24	0	+
192	do	18	F	36.0	34.0	.706	68.3	+25	2.0	+
193	do	87	D	36.0	34.0	.714	66.1	23	2.0	−
194	do	18	F	33.0	31.0	.744	58.2	+25	2.0	+
195	do	18	F	33.0	31.0	.745	57.9	+25	1.0	+
196	do	2	F	33.0	31.0	.724	63.4	25	2.0	+
197	do	20	F	33.0	31.0	.735	60.5	+25	2.0	+
198	do	20	F	36.0	34.0	.704	68.9	+25	2.0	+
199	do	61	F	32.0	30.0	.728	62.3	25	1.0	+
200	do	211	F	36.0	34.0	.721	64.2	23	2.0	+

[1] In this column, D means "distributing station"; F, "filling station"; G, "garage"; R, "refinery"; S, "service stations."

[2] Negative doctor tests are reported thus, −; positive tests are reported thus, +.

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Distillation range.[3]												Recovery (per cent).	Distillation loss (per cent).	Sample No.
Initial boiling point.	10 per cent.	20 per cent.	30 per cent.	40 per cent.	50 per cent.	60 per cent.	70 per cent.	80 per cent.	90 per cent.	End point.	Average boiling point.			
118	181	205	223	237	253	270	288	309	338	392	255	97.5	1.1	164
48	83	96	106	114	123	132	142	154	170	200	124			
108	158	187	210	226	244	262	284	311	349	419	250	97.0	1.7	165
42	70	86	99	108	118	128	140	155	176	215	121			
93	149	192	228	255	280	306	333	365	415	433	277	92.5	6.1	166
34	65	89	109	124	138	152	167	185	213	223	136			
113	174	207	230	248	266	284	304	329	358	414	266	97.0	1.6	167
45	79	97	110	120	130	140	151	165	181	212	130			
122	185	208	225	239	255	271	288	311	342	397	259	92.0	1.8	168
50	85	98	107	115	124	133	142	155	172	203	126			
113	171	205	230	248	266	282	302	324	358	406	264	97.0	1.6	169
45	77	96	110	120	130	139	150	162	181	208	129			
131	185	207	225	243	261	280	306	334	378	441	271	97.0	1.6	170
55	85	97	107	117	127	138	152	168	192	227	133			
118	190	225	248	266	284	302	324	347	385	442	284	97.0	1.5	171
48	88	107	120	130	140	150	162	175	196	228	140			
113	158	185	208	225	243	261	284	313	349	415	250	97.0	1.8	172
45	70	85	98	107	117	127	140	156	176	213	121			
118	183	219	244	264	284	304	324	347	388	441	284	97.0	1.8	173
48	84	104	118	129	140	151	162	175	198	227	140			
129	185	208	226	241	255	271	288	311	338	396	259	97.5	1.3	174
54	85	98	108	116	124	133	142	155	170	202	126			
117	176	208	230	248	266	284	304	327	363	414	268	97.0	1.8	175
47	80	98	110	120	130	140	151	164	184	212	131			
117	183	207	225	239	253	270	289	309	338	394	257	97.5	1.3	176
47	84	97	107	115	123	132	143	154	170	201	125			
122	196	226	248	266	284	302	322	347	383	441	286	97.0	1.6	177
50	91	108	120	130	140	150	161	175	195	227	141			
109	171	212	243	270	295	298	342	369	401	441	286	97.0	1.0	178
43	77	100	117	132	146	148	172	187	205	227	141			
122	187	212	234	252	266	289	311	334	374	439	275	97.5	1.1	179
50	86	100	112	122	130	143	155	168	190	226	135			
126	187	214	235	255	275	295	316	342	378	423	277	97.0	1.4	180
52	86	101	113	124	135	146	158	172	192	217	136			
120	180	216	241	262	286	306	327	352	383	439	282	97.0	1.6	181
49	82	102	116	128	141	152	164	178	195	226	139			
140	153	156	158	162	163	169	248	338	432	487	237	97.0	1.4	182
60	67	69	70	72	73	76	120	170	222	253	114			
108	172	207	230	250	266	282	298	325	356	419	264	97.0	1.8	183
42	78	97	110	121	130	139	148	163	180	215	129			
117	163	181	192	205	214	253	289	329	370	419	248	97.0	1.5	184
47	73	83	89	96	101	123	143	165	188	215	120			
100	144	181	217	252	284	311	340	367	405	453	277	96.0	2.6	185
38	62	83	103	122	140	155	171	186	207	234	136			
118	181	210	228	250	270	288	309	336	376	439	273	97.0	1.5	186
48	83	99	109	121	132	142	154	169	191	226	134			
122	187	217	237	253	275	293	309	338	374	435	277	97.5	.9	187
50	86	103	114	123	135	145	154	170	190	224	136			
104	156	172	181	190	203	232	313	383	428	469	257	95.5	2.6	188
40	69	78	83	88	95	111	156	195	220	243	125			
77	100	117	135	158	180	248	365	433	.....	482	230	85.0	13.0	189
25	38	47	57	70	82	120	185	223	.....	250	110			
127	185	210	228	244	259	270	289	311	349	396	261	97.0	1.6	190
53	85	99	109	118	126	132	143	155	176	202	127			
95	156	201	234	252	284	306	322	361	408	437	279	93.5	5.3	191
35	69	94	112	122	140	152	161	183	209	225	137			
82	113	140	167	201	234	266	302	340	397	419	243	91.0	7.4	192
28	45	60	75	94	112	130	150	171	203	215	117			
111	156	174	190	207	221	239	259	284	329	383	232	96.5	2.1	193
44	69	79	88	97	105	115	126	140	165	195	111			
93	147	180	207	230	248	282	304	334	381	417	257	95.0	3.6	194
34	64	82	97	110	120	139	151	168	194	214	125			
93	142	172	194	216	246	271	295	329	374	412	250	94.0	4.2	195
34	61	78	90	102	119	133	146	165	190	211	121			
95	144	172	198	221	239	262	284	313	356	423	246	96.0	2.0	196
35	62	78	92	105	115	128	140	156	180	217	119			
111	180	208	232	250	266	288	309	334	372	426	271	97.0	1.6	197
44	82	98	111	121	130	142	154	168	189	219	133			
72	106	151	201	255	291	316	349	403	.....	453	261	84.0	14.2	198
22	41	66	94	124	144	158	176	206	.....	234	127			
100	153	189	219	234	264	286	304	347	394	460	268	95.5	2.9	199
38	67	87	104	112	129	141	151	175	201	238	131			
84	135	167	203	232	252	289	316	352	414	428	261	91.0	7.4	200
29	57	75	95	111	122	143	158	178	212	220	127			

[3] For each sample, the upper line shows results in degrees Fahrenheit and the lower line in degrees centigrade.

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TABLE 4.—*Analyses of gasolines*

Sample No.	City.	Company No.	Sample collected from—	Price (cents per gallon).		Gravity at 60° F.		Color, Saybolt.	Unsaturation (per cent.)	Doctor test.
				Retail.	Tank wagon.	Specific gravity.	Baumé.			
201	Pittsburg	165	F	33.0	31.0	0.719	64.7	19	1.0	−
202	do	165	F	36.0	34.0	.697	70.9	+25	3.0	+
203	do	61	F	35.0	33.0	.715	65.8	24	3.0	+
204	do	2	F	33.0	31.0	.728	62.3	+25	2.0	+
205	do	211	F	33.0	31.0	.741	58.9	+25	2.0	+
206	do	211	F	36.0	34.0	.723	63.6	20	1.0	+
207	do	18	F	36.0	34.0	.709	67.5	25	2.0	+
208	Cincinnati	54	F	31.0	.....	.731	61.5	+25	2.0	+
209	do	22	F	31.0	.....	.741	58.9	+25	2.0	+
210	do	91	F	32.0	30.0	.729	62.0	22	1.5	−
211	do	91	F	39.0	.....	.713	66.4	+25	2.0	−
212	do	158	D	31.0	30.0	.740	59.2	24	1.0	−
213	do	184	F	40.0	.....	.710	67.2	22	2.0	−
214	do	22	F	31.0	.....	.744	58.2	+25	1.5	+
215	do	67	D	31.0	30.0	.739	59.4	17	3.0	+
216	do	184	D	31.0	30.0	.753	55.9	+25	1.0	+
217	do	265	F	31.0	30.0	.741	58.9	20	1.0	−
218	do	114	D	31.0	30.0	.724	63.4	+25	2.0	+
219	Chicago	6	G	29.0	27.0	.747	57.4	20	1.0	−
220	do	3	F	29.0	27.0	.742	58.7	+25	5.0	−
221	do	3	F	29.0	27.0	.742	58.7	15	3.0	−
222	do	266	F	29.0	27.0	.744	58.2	+25	2.0	−
223	do	4	G	29.0	27.0	.742	58.7	22	3.0	−
224	do	267	F	30.0	27.0	.839	36.9	23	1.0	−
225	do	4	G	29.0	27.0	.742	58.7	22	4.0	−
226	do	260	F	31.0	27.0	.740	59.2	+25	1.0	+
227	do	259	G	29.0	27.0	.810	42.8	12	.5	+
228	do	3	F	29.0	27.0	.740	59.2	+25	4.0	−
229	do	263	G	31.0	30.0	.755	55.4	+25	1.0	−
230	do	263	G	29.0	27.0	.748	57.2	+25	2.0	+
231	do	1	G	29.0	27.0	.793	46.5	23	1.5	−
232	do	1	G	28.5	26.5	.744	58.2	24	1.0	−
233	New Orleans	2	F	28.5	.....	.735	60.5	24	2.0	+
234	do	4	D	28.5	26.5	.762	53.7	24	1.0	−
235	do	264	F	28.5	.....	.745	57.9	19	1.0	−
236	do	2	F	28.5	.....	.734	60.7	24	1.0	+
237	do	4	D	40.0	.....	.728	62.3	22	1.0	−
238	do	188	F	28.5	.....	.747	57.4	+25	2.0	−
239	do	1	D	28.5	.....	.747	57.4	19	.5	−

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marketed in January, 1921—Continued.

Distillation range.												Recovery (per cent).	Distillation loss (per cent).	Sample No.
Initial boiling point.	10 per cent.	20 per cent.	30 per cent.	40 per cent.	50 per cent.	60 per cent.	70 per cent.	80 per cent.	90 per cent.	End point.	Average boiling point.			
88	142	178	212	241	262	289	309	340	396	414	261	92.0	6.4	201
31	61	81	100	116	128	143	154	171	202	212	127			
82	118	145	163	199	226	248	270	316	396	414	234	91.0	7.4	202
28	48	63	73	93	108	120	132	158	202	212	112			
88	129	158	196	234	264	291	324	365	451	473	270	92.0	6.0	203
31	54	70	91	112	129	144	162	185	233	245	132			
90	149	178	207	228	246	264	288	318	356	419	250	96.5	2.1	204
32	65	81	97	109	119	129	142	159	180	215	121			
91	162	203	235	264	286	311	329	356	396	437	279	94.5	3.9	205
33	72	95	113	129	141	155	165	180	202	225	137			
82	133	165	196	225	255	282	315	340	417	424	257	91.0	7.0	206
28	56	74	91	107	124	139	157	171	214	218	125			
84	122	149	180	212	244	277	313	345	419	424	252	90.0	8.6	207
29	50	65	82	100	118	136	156	174	215	218	122			
109	154	183	207	230	252	277	302	334	372	444	260	97.0	1.7	208
43	68	84	97	110	122	136	150	168	189	229	127			
102	174	208	232	250	271	295	318	345	396	450	277	95.0	3.6	209
39	79	98	111	121	133	146	159	174	202	232	136			
138	194	210	225	237	250	264	280	297	327	383	255	98.0	.8	210
59	90	99	107	114	121	129	138	147	164	195	124			
135	167	178	189	199	207	217	230	246	273	338	216	97.0	1.8	211
57	75	81	87	93	97	103	110	119	134	170	102			
115	176	208	237	261	286	315	340	363	396	444	286	97.5	1.1	212
46	80	98	114	127	141	157	171	184	202	229	141			
124	158	174	187	199	210	221	234	250	282	340	216	97.5	1.5	213
51	70	79	86	93	99	105	112	121	139	171	102			
102	178	208	232	252	271	284	320	349	399	451	277	95.0	3.6	214
39	81	98	111	122	133	140	160	176	204	233	136			
106	156	185	210	230	252	275	302	334	385	441	261	97.0	1.6	215
41	69	85	99	110	122	135	150	168	196	227	127			
126	189	221	243	266	288	315	340	372	408	462	293	97.5	1.3	216
52	87	105	117	130	142	157	171	189	209	239	145			
91	151	189	250	286	311	342	361	385	424	455	295	94.0	4.2	217
33	66	87	121	141	155	172	183	196	218	235	146			
95	142	176	201	228	250	273	306	342	381	450	259	96.2	2.4	218
35	61	80	94	109	121	134	152	172	194	232	126			
127	180	201	219	237	252	273	300	325	374	451	268	98.0	.4	219
53	82	94	104	114	122	134	149	163	190	233	131			
109	176	208	235	257	280	302	327	356	392	433	280	96.0	2.5	220
43	80	98	113	125	138	150	164	180	200	223	138			
86	149	180	208	252	279	302	331	367	421	433	273	92.0	6.4	221
30	65	82	98	122	137	150	166	186	216	223	134			
126	194	212	226	241	255	273	289	311	343	405	261	97.0	1.7	222
52	90	100	108	116	124	134	143	155	173	207	127			
95	147	180	223	248	270	297	327	356	408	426	271	93.5	4.8	223
35	64	82	106	120	132	147	164	180	209	219	133			
165	178	180	183	187	194	214	280	378	432	473	261	97.0	1.0	224
74	81	82	84	86	90	101	138	192	222	245	127			
88	151	189	221	248	275	307	327	360	406	446	275	94.0	4.7	225
31	66	87	105	120	135	153	164	182	208	230	135			
136	190	208	223	239	252	270	291	316	352	435	264	98.5	.5	226
58	88	98	106	115	122	132	144	158	178	224	129			
172	180	181	183	185	187	199	228	352	410	462	250	97.0	1.4	227
78	82	83	84	85	86	83	109	178	210	239	121			
104	172	192	232	255	277	298	320	349	387	432	275	97.0	1.8	228
40	78	89	111	124	136	148	160	176	197	222	135			
97	160	190	210	230	255	282	313	345	396	446	266	96.5	2.5	229
36	71	88	99	110	124	139	156	174	202	230	130			
124	167	176	183	187	194	203	225	279	351	432	228	98.0	.6	230
51	75	80	84	86	90	95	107	137	177	222	109			
106	163	189	212	234	252	277	302	334	372	432	261	95.5	2.3	231
41	73	87	100	112	122	136	150	168	189	222	127			
104	160	190	216	237	255	279	304	331	376	439	262	96.0	2.7	232
40	71	88	102	114	124	137	151	166	191	226	128			
109	171	194	216	234	255	275	297	322	360	435	261	97.0	1.4	233
43	77	90	102	112	124	135	147	161	182	224	127			
158	208	225	241	255	271	289	302	322	352	410	275	98.5	.7	234
70	98	107	116	124	133	143	150	161	178	210	135			
153	212	234	250	268	288	304	322	340	379	442	289	98.0	.8	235
67	100	112	121	131	142	151	161	171	193	228	143			
117	167	194	214	234	248	271	293	318	356	432	259	97.0	1.5	236
47	75	90	101	112	120	133	145	159	180	222	126			
126	167	181	194	205	219	230	248	270	304	381	230	98.0	.6	237
52	75	83	90	96	104	110	120	132	151	194	110			
117	199	239	264	284	304	316	334	352	378	426	293	97.5	.9	238
47	93	115	129	140	151	158	168	178	192	219	145			
115	181	212	239	257	275	298	318	354	381	446	280	98.0	.8	239
46	83	100	115	125	135	148	159	179	194	230	138			

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TABLE 4.—*Analyses of gasolines*

Sample No.	City.	Company No.	Sample collected from—	Price (cents per gallon).		Gravity at 60° F.		Color, Saybolt.	Unsaturation (per cent).	Doctor test.
				Retail.	Tank wagon.	Specific gravity.	Baumé.			
240	New Orleans	17	F	28.5		0.742	58.7	+25	0.5	−
241	do	56	F	28.5		.743	58.4	+25	1.0	−
242	do	1	G	28.5		.747	57.4	18	1.0	−
243	do	17	F	28.5		.742	58.7	+25	0	−
244	do	1	F	28.5		.746	57.7	18	2.0	−
245	St. Louis	3	F	28.5	26.5	.745	57.9	23	3.0	−
246	do	9	F	28.5	26.5	.748	57.2	22	1.0	+
247	do	99	F	28.5		.745	57.9	18	2.0	−
248	do	9	F	28.5	26.5	.748	57.2	22	2.0	−
249	do	99	F	31.5		.741	58.9	16	1.0	−
250	do	3	F	28.5	26.5	.744	58.2	+25	3.0	−
251	do	1	F	28.5	26.5	.743	58.4	+25	.5	−
252	do	1	F	28.5	26.5	.736	60.2	+25	.5	−
253	do	273	G	30.0		.750	56.7	24	2.0	−
254	do	274	D	28.5		.750	56.7	25	1.0	+
255	do	275	F	28.5	26.5	.729	62.0	15	1.0	+
256	do	99	F	33.0		.734	60.7	16	1.0	−
257	do	3	F	28.5	26.5	.744	58.2	+25	4.0	+
258	do	276	G	31.0		.739	59.4	+25	Trace.	−
259	do	215	F	28.5		.734	60.7	23	1.0	−
260	do	215	F	30.5		.734	60.7	25	1.0	−
261	Salt Lake	81	F	34.0	32.0	.756	55.2	24	6.0	+
262	do	100	S	34.0	32.0	.755	55.4	25	6.0	+
263	do	121	S	34.0	32.0	.753	55.9	25	13.0	+
264	do	81	R			.754	55.7	25	6.0	+
265	do	100	S	34.0	32.0	.756	55.2	24	7.0	+
266	do	121	S	40.0	38.0	.734	60.7	25	9.0	+
267	San Francisco	13	S	27.0		.763	53.5	+25	2.0	+
268	do	14	S	27.0		.768	52.3	24	2.0	+
269	do	16	S	27.0		.765	53.0	+25	2.0	−
270	do	19	S	27.0		.754	55.7	23	2.0	−
271	do	16	S	27.0		.765	53.0	25	2.0	−
272	do	19	S	27.0		.754	55.7	22	2.0	+
273	do	13	S	27.0		.764	53.2	+25	2.0	+
274	do	16	S	27.0		.765	53.0	+25	2.0	+
275	do	19	S	27.0		.754	55.7	23	2.0	−
276	do	14	G	27.0		.766	52.8	23	1.0	+
277	do	13	S	27.0		.764	53.2	+25	1.0	+
278	do	14	S	27.0		.767	52.5	23	2.0	+

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marketed in January, 1921—Continued.

Distillation range.											Average boiling point.	Recovery (per cent).	Distillation loss (per cent).	Sample No.
Initial boiling point.	10 per cent.	20 per cent.	30 per cent.	40 per cent.	50 per cent.	60 per cent.	70 per cent.	80 per cent.	90 per cent.	End point.				
113	181	217	226	266	286	311	329	347	381	435	280	97.5	1.1	240
45	83	103	108	130	141	155	165	175	194	224	138			
122	176	196	217	234	253	280	304	329	363	421	262	98.0	1.0	241
50	80	91	103	112	123	138	151	165	184	216	128			
122	187	214	237	257	277	300	318	343	381	446	280	98.0	.8	242
50	86	101	114	125	136	149	159	173	194	230	138			
109	174	210	237	261	284	306	320	347	376	428	277	97.5	1.0	243
43	79	99	114	127	140	152	160	175	191	220	136			
117	185	212	232	253	275	297	316	338	381	442	277	97.5	1.3	244
47	85	100	111	123	135	147	158	170	194	228	136			
95	169	216	248	271	297	316	338	360	392	424	284	94.5	3.8	245
35	76	102	120	133	147	158	170	182	200	218	140			
135	187	207	225	243	261	280	302	329	370	457	271	97.5	1.1	246
57	86	97	107	117	127	138	150	165	188	236	133			
117	167	216	252	279	304	320	351	379	419	462	297	94.5	4.5	247
47	75	102	122	137	151	160	177	193	215	239	147			
140	185	205	223	239	253	270	300	324	369	455	270	98.0	.7	248
60	85	96	106	115	123	132	149	162	187	235	132			
104	158	192	223	248	273	302	320	358	397	453	275	96.5	1.9	249
40	70	89	106	120	134	150	160	181	203	234	135			
91	165	214	250	280	300	320	343	365	401	428	288	94.0	4.8	250
33	74	101	121	138	149	160	173	185	205	220	142			
131	181	201	216	232	248	266	288	313	347	415	259	98.0	.6	251
55	83	94	102	111	120	130	142	156	175	213	126			
122	178	201	219	235	253	273	293	318	356	424	261	97.0	1.6	252
50	81	94	104	113	123	134	145	159	180	218	127			
99	165	232	271	304	329	351	379	419	.....	460	300	86.0	12.6	253
37	74	111	133	151	165	177	193	215	.....	238	149			
115	196	225	239	261	277	298	320	347	396	460	284	97.0	1.8	254
46	91	107	115	127	136	148	160	175	202	238	140			
97	138	169	192	221	244	270	298	331	379	453	253	96.0	2.3	255
36	59	76	89	105	118	132	148	166	193	234	123			
124	153	181	208	235	259	284	313	347	383	448	266	97.0	1.8	256
51	67	83	98	113	126	140	156	175	195	231	130			
95	167	212	252	279	300	324	338	361	392	426	286	94.5	4.5	257
35	75	100	122	137	149	162	170	183	200	219	141			
127	181	201	217	235	252	273	295	320	352	421	261	98.0	.7	258
53	83	94	103	113	122	134	146	160	178	216	127			
113	163	183	203	223	243	264	295	334	381	453	259	97.5	1.1	259
45	73	84	95	106	117	129	146	168	194	234	126			
113	162	185	205	219	248	273	302	334	387	460	262	97.5	1.3	260
45	72	85	96	104	120	134	150	168	197	238	128			
117	174	212	239	264	288	315	340	367	397	432	286	97.0	1.5	261
47	79	100	115	129	142	157	171	186	203	222	141			
109	174	212	239	264	291	316	342	363	399	437	286	96.5	1.7	262
43	79	100	115	129	144	158	172	184	204	225	141			
122	183	212	243	264	286	309	333	360	399	446	288	97.0	1.4	263
50	84	100	117	129	141	154	167	182	204	230	142			
109	174	212	239	262	288	313	338	363	401	444	286	96.5	1.9	264
43	79	100	115	128	142	156	170	184	205	229	141			
111	174	212	241	261	282	315	338	367	399	435	286	96.5	1.9	265
44	79	100	116	127	139	157	170	186	204	224	141			
104	145	176	205	232	259	288	316	347	396	441	264	95.0	3.0	266
40	63	80	96	111	126	142	158	175	202	227	129			
136	198	217	230	243	257	270	289	300	340	403	262	98.0	.5	267
58	92	103	110	117	125	132	243	149	171	206	128			
131	194	216	235	250	266	282	300	320	356	419	270	97.5	.9	268
55	90	102	113	121	130	139	149	160	180	215	132			
111	180	217	244	264	282	302	322	345	381	433	280	96.5	2.0	269
44	82	103	118	129	139	150	161	174	194	223	138			
108	165	192	214	232	246	262	282	306	340	412	252	96.5	1.9	270
42	74	89	101	111	119	128	139	152	171	211	122			
111	174	210	237	261	280	298	320	342	376	428	277	96.5	1.9	271
44	79	99	114	127	138	148	160	172	191	220	136			
108	162	192	212	230	246	264	282	306	340	410	250	97.0	1.4	272
42	72	89	100	110	119	129	139	152	171	210	121			
136	199	217	232	244	257	275	291	311	343	401	264	97.5	1.1	273
58	93	103	111	118	125	135	144	155	173	205	129			
111	174	216	241	261	279	298	316	345	379	428	277	96.5	1.7	274
44	79	102	116	127	137	148	158	174	193	220	136			
108	163	192	212	230	246	259	282	306	343	414	250	96.5	1.9	275
142	73	89	100	110	119	126	139	152	173	212	121			
26	192	219	234	250	264	279	297	316	358	423	270	97.5	1.0	276
52	89	104	112	121	129	137	147	158	181	217	132			
135	199	219	234	246	261	275	291	313	347	406	266	97.0	1.6	277
57	93	104	112	119	127	135	144	156	175	208	130			
126	192	216	234	248	264	280	297	320	358	421	268	97.5	.9	278
52	89	102	112	120	129	138	147	160	181	216	131			

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TABLE 5.—*Analyses of gasolines*

Sample No.	City.	Company No.	Sample collected from[1]—	Price (cents per gallon).		Gravity at 60° F.		Color, Saybolt.	Unsaturation (per cent).	Doctor test.[2]
				Retail.	Tank wagon.	Specific gravity.	Baumé.			
279	New York	2	F	28.0	24.0	0.738	59.7	24	3.0	+
280	do	211	G	28.0	24.0	.742	58.7	24	4.0	+
281	do	5	G	28.0	24.0	.735	60.5	16	7.0	+
282	do	21	F	27.0	24.0	.738	59.7	22	7.0	−
283	do	21	G	28.0	24.0	.738	59.7	24	7.0	−
284	do	5	F	27.0	24.0	.735	60.5	25	7.0	+
285	do	5	F	28.0	24.0	.735	60.5	25	6.0	+
286	do	21	G	28.0	24.0	.735	60.5	23	7.0	−
287	do	1	F	27.0	.....	.745	57.9	23	6.0	−
288	do	2	F	27.0	24.0	.738	59.7	25	2.0	+
289	do	20	G	.....	.....	.740	59.2	25	5.0	+
290	do	211	G	29.0	24.0	.738	59.7	25	4.0	+
291	do	20	G	27.0	.....	.739	59.4	25	9.0	−
292	do	1	F	27.0	24.0	.745	57.9	22	6.0	−
293	do	5	F	27.0	24.0	.734	60.7	25	7.0	+
294	do	5	F	28.0	24.0	.736	60.2	25	7.0	+
295	Washington	116	G	25.0	22.0	.752	56.2	25	6.0	−
296	do	1	F	24.0	22.0	.752	56.2	21	6.0	−
297	do	252	F	32.0	29.5	.814	42.0	16	40.0	−
298	do	262	F	23.0	22.0	.740	59.2	19	8.0	+
299	do	7	F	24.0	22.0	.742	58.7	25	6.0	+
300	do	199	F	27.0	24.0	.780	49.5	25	8.0	+
301	do	199	F	24.0	.....	.748	57.2	25	5.0	+
302	do	7	F	24.0	22.0	.746	57.7	25	4.0	+
303	do	1	F	24.0	22.0	.745	57.9	25	5.0	+
304	do	7	D	.....	22.0	.743	58.4	25	7.0	+
305	do	116	F	27.0	24.0	.763	53.5	25	4.0	−
306	do	268	F	24.0	.....	.745	57.9	25	2.0	+
307	Pittsburgh	87	F	25.0	.....	0.734	60.7	24	3.0	−
308	do	87	F	28.0	.....	.729	62.0	21	3.5	−
309	do	18	F	28.0	25.0	.708	67.7	25	3.0	+
310	do	18	F	25.0	22.0	.744	58.2	18	4.0	+
311	do	251	F	25.0	23.0	.798	45.4	21	3.0	−
312	do	251	F	25.0	23.0	.736	60.2	25	3.0	−
313	do	211	F	28.0	.....	.725	63.1	25	3.5	−
314	do	211	F	25.0	.....	.745	57.9	21	1.0	−

[1] In this column D means "distributing station"; F, "filling station"; G, "garage" R, "refinery" S, "service station."
[2] Negative doctor tests are reported thus, −; positive tests are reported thus, +.

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marketed in July, 1921.

Distillation range.[3]												Recovery (per cent).	Distillation loss (per cent).	Sample No.
Initial boiling point.	10 per cent.	20 per cent.	30 per cent.	40 per cent.	50 per cent.	60 per cent.	70 per cent.	80 per cent.	90 per cent.	End point.	Average boiling point.			
117	174	203	225	243	262	282	304	329	376	433	268	96.0	2.6	279
47	79	95	107	117	128	139	151	165	191	223	131			
124	180	207	226	243	259	275	297	322	361	417	264	96.5	2.1	280
51	82	97	108	117	126	135	147	161	183	214	129			
126	181	205	221	235	252	266	286	307	340	397	255	97.0	1.8	281
52	83	96	105	113	122	130	141	153	171	203	124			
124	176	205	228	248	266	286	307	333	369	419	270	97.0	1.6	282
51	80	96	109	120	130	141	153	167	187	215	132			
129	176	207	230	248	270	289	309	336	372	419	271	95.5	3.1	283
54	80	97	110	120	132	143	154	169	189	215	133			
129	183	207	225	241	253	271	289	311	349	399	261	96.0	2.6	284
54	84	97	107	116	123	133	143	155	176	204	127			
126	187	210	226	243	261	275	297	318	352	403	264	97.0	1.6	285
52	86	99	108	117	127	135	147	159	178	206	129			
127	171	201	225	246	264	284	304	329	365	414	266	96.5	2.3	286
53	77	94	107	119	129	140	151	165	185	212	130			
113	178	207	234	255	275	297	320	347	390	453	279	96.0	2.8	287
45	81	97	112	124	135	147	160	175	199	234	137			
124	180	207	228	246	266	284	307	334	374	437	271	96.0	2.8	288
51	82	97	109	119	130	140	153	168	190	225	133			
120	187	221	246	266	286	306	322	349	379	435	284	97.0	1.8	289
49	86	105	119	130	141	152	161	176	193	224	140			
129	181	212	230	246	262	280	300	325	365	423	268	96.5	2.3	290
54	83	100	110	119	128	138	149	163	185	217	131			
131	187	212	232	252	268	289	313	336	370	428	275	97.0	1.8	291
55	86	100	111	122	131	143	156	169	188	220	135			
122	172	208	234	257	277	297	324	347	385	451	279	97.0	1.8	292
50	78	98	112	125	136	147	162	175	196	233	137			
131	176	207	226	241	259	275	293	316	349	410	262	97.0	1.8	293
55	80	97	108	116	126	135	145	158	176	210	128			
131	185	210	228	243	259	275	293	315	347	405	262	97.0	1.8	294
55	85	99	109	117	126	135	145	157	175	207	128			
120	183	214	241	262	282	304	327	351	385	433	282	96.0	2.8	295
49	84	101	116	128	139	151	164	177	196	223	139			
129	196	223	244	262	280	300	320	343	381	446	284	97.5	1.5	296
54	91	106	118	128	138	149	160	173	194	230	140			
144	151	154	156	160	162	165	237	316	421	496	234	97.0	1.6	297
62	66	68	69	71	72	74	114	158	216	258	112			
109	163	198	226	252	275	297	316	340	374	421	270	95.5	3.3	298
43	73	92	108	122	135	147	158	171	190	216	132			
127	190	217	239	259	279	298	320	345	383	437	282	97.0	1.8	299
53	88	103	115	126	137	148	160	174	195	225	139			
140	180	192	201	214	232	257	286	324	369	426	257	97.0	1.8	300
60	82	89	94	101	111	125	141	162	187	219	125			
135	192	216	237	259	282	306	325	352	392	437	284	97.0	1.8	301
57	89	102	114	126	139	152	163	178	200	225	140			
131	187	212	232	252	277	298	320	345	381	437	279	97.5	1.3	302
55	86	100	111	122	136	148	160	174	194	225	137			
140	187	212	234	253	273	293	318	345	383	441	280	97.0	1.8	303
60	86	100	112	123	134	145	159	174	195	227	138			
129	192	221	243	264	279	300	325	345	383	437	284	97.0	1.4	304
54	89	105	117	129	137	149	163	174	195	225	140			
122	165	187	208	230	266	298	334	369	414	464	279	96.0	2.2	305
50	74	86	98	110	130	148	168	187	212	240	137			
131	187	208	228	246	264	288	309	334	374	435	273	97.0	2.0	306
55	86	98	109	119	129	142	154	168	190	224	134			
117	176	210	230	248	266	286	306	329	363	403	266	96.5	2.4	307
47	80	99	110	120	130	141	152	165	184	206	130			
113	171	201	225	243	261	279	304	329	361	401	262	96.0	2.9	308
45	77	94	107	117	127	137	151	165	183	205	128			
93	127	151	174	198	221	246	275	316	374	419	235	94.0	5.0	309
34	53	66	79	92	105	119	135	158	190	215	113			
108	158	183	207	228	250	277	304	331	372	430	259	96.0	3.0	310
42	70	84	97	109	121	136	151	166	189	221	126			
120	160	174	183	192	205	228	298	379	430	477	259	97.0	1.8	311
49	71	79	84	89	96	109	148	193	221	247	126			
97	122	142	167	199	250	313	372	415	459	491	275	94.0	4.2	312
36	50	61	75	93	121	156	189	213	237	255	135			
99	145	171	194	216	237	261	291	322	378	424	248	95.0	3.9	313
37	63	77	90	102	114	127	144	161	192	218	120			
117	176	203	221	241	257	280	304	329	378	442	268	97.0	1.8	314
47	80	95	105	116	125	138	151	165	192	228	131			

[3] For each sample the upper line shows results in degrees Fahrenheit and the lower line in degrees centigrade.

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TABLE 5.—*Analyses of gasolines*

Sample No.	City.	Company No.	Sample collected from—	Price (cents per gallon).		Gravity at 60° F.		Color, Saybolt.	Unsaturation (per cent).	Doctor test.
				Retail.	Tank wagon.	Specific gravity.	Baumé.			
315	Pittsburgh	2	F	25.0	24.0	0.732	61.3	24	2.0	+
316	do	20	F	28.0		.716	65.5	25	2.5	+
317	do	20	F	25.0		.743	58.4	25	3.0	+
318	do	61	F	25.0	23.0	.734	60.7	21	2.0	−
319	do	61	F	28.0	26.0	.739	59.4	21	2.0	−
320	do	18	F	28.0	26.5	.708	67.7	25	3.0	+
321	do	18	F	25.0	23.5	.741	58.9	21	2.0	+
322	do	2	F	25.0		.738	59.7	18	2.5	+
323	do	211	F	28.0	26.0	.722	63.9	21	2.0	−
324	do	211	F	25.0	23.0	.739	59.4	25	3.0	−
325	do	271	F	25.0		.727	62.6	25	2.5	−
326	do	271	F	28.0		.728	62.3	18	2.0	−
327	do	165	F	25.0		.736	60.2	25	1.5	−
328	Chicago	80	D	25.0	23.0	.731	61.5	25	1.5	−
329	do	1	G	20.0	18.0	.745	57.9	24	2.0	−
330	do	282	S	20.0	18.0	.757	54.9	18	5.5	−
331	do	266	D	20.0	18.0	.747	57.4	25	2.0	−
332	do	6	G	20.0	18.0	.755	55.4	18	3.0	−
333	do	267	S	21.0		.820	40.7	18	3.0	−
334	do	3	S	20.0	18.0	.748	57.2	25	8.0	−
335	do	4	F	20.0	18.0	.751	56.4	21	5.5	−
336	do	80	D	25.0	23.0	.751	56.4	24	1.5	−
337	do	259	S	21.0	19.0	.808	43.3	18	4.5	−
338	do	77	D	20.0	18.0	.746	57.7	18	2.0	−
339	do	3	D	20.0	18.0	.747	57.4	25	5.0	−
340	do	259	S	21.0	19.0	.783	48.8	18	4.5	−
341	do	260	D	20.0	18.0	.746	57.7	25	2.0	−
342	do	3	F	20.0	18.0	.748	57.2	25	8.0	−
343	New Orleans	56	S	19.5	16.5	.750	56.7	25	2.0	−
344	do	278	D	19.5	16.5	.741	58.9	21	1.0	−
345	do	17	F	19.5	16.5	.747	57.4	24	8.0	+
346	do	277	G	19.5	16.5	.745	57.9	21	1.5	−
347	do	8	S	19.5	16.0	.744	58.2	24	1.5	−
348	do	17	F	19.5	16.5	.746	57.7	24	7.0	+
349	do	1	F	19.5	16.5	.748	57.2	21	5.5	−
350	do	2	F	19.5		.739	59.4	24	2.0	+
351	do	279	G	19.5	16.0	.740	59.2	21	1.0	−
352	do	172	F	19.5	16.5	.737	60.0	21	1.0	−
353	do	264	F	19.5	16.5	0.749	56.9	21	1.0	−

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Distillation range.												Recovery (per cent).	Distillation loss (per cent).	Sample No.
Initial boiling point.	10 per cent.	20 per cent.	30 per cent.	40 per cent.	50 per cent.	60 per cent	70 per cent.	80 per cent.	90 per cent	End point.	Average boiling point.			
113	163	190	212	230	250	271	286	322	363	426	257	97.0	1.8	315
45	73	88	100	110	121	133	141	161	184	219	125			
91	133	163	198	235	268	295	316	338	388	444	261	94.0	4.7	316
33	56	73	92	113	131	146	158	170	198	229	127			
129	189	217	239	262	284	309	331	356	396	453	288	97.0	1.6	317
54	87	103	115	128	140	154	166	180	202	234	142			
120	165	189	210	232	257	282	307	345	390	464	270	96.0	2.4	318
49	74	87	99	111	125	139	153	174	199	240	132			
126	176	196	217	239	257	282	313	342	392	471	273	97.0	1.4	319
52	80	91	103	115	125	139	156	172	200	244	134			
93	129	154	180	203	223	248	275	311	369	412	235	94.0	4.8	320
34	54	68	82	95	106	120	135	155	187	211	113			
106	147	171	194	214	237	266	297	331	372	423	250	95.5	3.1	321
41	64	77	90	101	114	130	147	166	189	217	121			
129	181	203	223	241	259	280	304	331	365	430	268	97.5	1.3	322
54	83	95	106	116	126	138	151	166	185	221	131			
109	145	167	187	208	225	248	273	311	360	417	241	96.0	2.6	323
43	63	75	86	98	107	120	134	155	182	214	116			
122	167	192	217	239	255	277	304	334	383	433	266	96.0	2.8	324
50	75	89	103	115	124	136	151	168	195	223	130			
108	142	165	190	212	234	255	293	329	383	426	248	96.0	2.6	325
42	61	74	88	100	112	124	145	165	195	219	120			
108	144	169	194	216	237	259	295	331	387	433	252	96.0	2.8	326
42	62	76	90	102	114	126	146	166	197	223	122			
126	174	194	212	230	252	271	293	320	356	410	259	97.0	1.8	327
52	79	90	100	110	122	133	145	160	180	210	126			
122	169	185	199	212	228	243	261	288	331	401	239	97.5	1.3	328
50	76	85	93	100	109	117	127	142	166	205	115			
109	165	194	221	244	271	298	324	367	412	464	279	96.0	2.6	329
43	74	90	105	118	133	148	162	186	211	240	137			
109	169	203	234	261	291	320	345	378	415	462	289	97.0	1.8	330
43	76	95	112	127	144	160	174	192	213	239	143			
136	187	208	228	248	264	295	320	349	387	439	279	97.0	1.8	331
58	86	98	109	120	129	146	160	176	197	226	137			
145	194	214	234	250	271	289	315	338	379	430	279	97.0	1.6	332
63	90	101	112	121	133	143	157	170	193	221	137			
144	172	180	185	189	196	208	234	300	392	466	243	97.5	.9	333
62	78	82	85	87	91	98	112	149	200	241	117			
118	178	208	234	257	275	297	325	343	383	430	277	97.0	1.8	334
48	81	98	112	125	135	147	163	173	195	221	136			
115	176	214	243	270	291	316	342	369	410	457	291	96.0	2.6	335
46	80	101	117	132	144	158	172	187	210	236	144			
124	185	212	234	255	271	297	320	352	392	446	280	97.0	1.8	336
51	85	100	112	124	133	147	160	178	200	230	138			
144	174	183	192	201	214	241	289	345	397	460	259	97.0	1.4	337
62	79	84	89	94	101	116	143	174	203	238	126			
131	190	212	228	248	264	286	313	343	385	455	279	98.0	1.0	338
55	88	100	109	120	129	141	156	173	196	235	137			
115	167	201	230	259	282	304	329	356	388	430	279	97.0	1.6	339
46	75	94	110	126	139	151	165	180	198	221	137			
124	169	187	201	217	244	286	324	363	408	453	271	96.5	2.1	340
51	76	86	94	103	118	141	162	184	209	234	133			
127	190	214	235	250	270	291	311	334	374	432	275	97.0	1.5	341
53	88	101	113	121	132	144	155	168	190	222	135			
118	180	210	234	257	280	302	324	349	385	430	279	97.0	1.8	342
48	82	99	112	125	138	150	162	176	196	221	137			
135	189	210	228	248	268	288	313	342	376	428	275	97.0	1.8	343
57	87	99	109	120	131	142	156	172	191	220	135			
131	190	217	239	257	275	295	311	336	367	410	275	97.0	2.0	344
55	88	103	115	125	135	146	155	169	186	210	135			
131	189	217	241	261	280	302	322	343	376	426	280	97.0	2.0	345
55	87	103	116	127	138	150	161	173	191	219	138			
138	196	223	248	268	291	309	331	354	385	433	289	97.0	2.0	346
59	91	106	120	131	144	154	166	179	196	223	143			
120	189	221	246	268	288	307	325	347	378	423	282	97.0	1.8	347
49	87	105	119	131	142	153	163	175	192	217	139			
122	183	214	237	259	280	297	320	340	374	428	277	97.0	2.0	348
50	84	101	114	126	138	147	160	171	190	220	136			
129	183	210	232	252	268	293	313	338	370	433	275	97.5	1.3	349
54	84	99	111	122	131	145	156	170	188	223	135			
126	176	201	223	239	259	279	298	324	361	428	264	97.0	2.0	350
52	80	94	106	115	126	137	148	162	183	230	129			
131	189	214	235	255	279	300	320	342	374	433	279	97.5	1.5	351
55	87	101	113	124	137	149	160	172	190	223	137			
144	190	207	223	241	255	277	298	324	356	423	268	97.5	1.7	352
62	88	97	106	116	124	136	148	162	180	217	131			
133	172	217	271	307	329	352	361	388	415	439	307	96.0	2.8	353
56	78	103	133	153	165	178	183	198	213	226	153			

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TABLE 5.—*Analyses of gasolines*

Sample No.	City.	Company No.	Sample collected from—	Price (cents per gallon).		Gravity at 60° F.		Color, Saybolt.	Unsaturation (per cent).	Doctor test.
				Retail.	Tank wagon.	Specific gravity.	Baumé.			
354	St. Louis	9	F	19.7	17.4	.749	56.9	24	1.5	−
355	do	9	F	19.7	17.4	.746	57.7	21	1.5	−
356	do	50	S	19.7	17.4	.742	58.7	24	2.0	−
357	do	1	F	19.7	17.4	.749	56.9	24	2.0	−
358	do	275	F	19.7		.743	58.4	25	2.0	−
359	do	4	F	19.7	17.4	.752	56.2	24	2.0	−
360	do	3	F	19.7	17.4	.748	57.2	21	12.0	−
361	do	1	F	19.7	17.4	.759	54.5	21	1.0	−
362	do	215	F	19.7	17.4	.747	57.4	21	2.5	−
363	do	274	D	19.7	17.4	.750	56.7	21	2.0	−
364	do	3	F	19.7	17.4	.748	57.2	21	10.0	−
365	do	273	D	19.7	17.4	.754	55.7	24	2.0	−
366	do	99	D	19.7	17.4	.750	56.7	24	2.0	−
367	do	99	D	22.7		.737	60.0	24	3.0	+
368	do	3	D	19.7	17.4	.749	56.9	21	9.0	−
369	do	99	D	24.2		.711	66.9	25	2.5	−
370	Denver	283	F	23.0	21.0	.747	57.4	25	1.0	−
371	do	4	F	23.0	21.0	.752	56.2	25	2.0	+
372	do	258	S	23.0	21.0	.752	56.2	25	1.5	−
373	do	60	F	23.0	21.0	.759	54.5	24	4.0	+
374	do	60	F	23.0	21.0	.741	58.9	25	2.0	−
375	do	284	F	23.0	21.0	.751	56.4	25	3.0	−
376	Salt Lake	258	F	31.0	29.0	.728	62.3	25	2.0	−
377	do	258	F	26.0	24.0	.753	55.9	21	2.0	−
378	do	81	D	26.0	24.0	.759	54.5	21	7.0	+
379	do	81	D	29.0	27.0	.727	62.6	25	6.0	+
380	do	81	R			.728	62.3	24	12.0	+
381	do	81	R			.757	54.9	21	7.5	+
382	San Francisco	13	S	25.0		.761	54.0	24	2.0	−
383	do	14	S	25.0		.768	52.3	18	1.0	+
384	do	16	S	25.0		.764	53.2	21	1.0	−
385	do	19	S	25.0		.757	54.9	18	1.5	−
386	do	16	S	25.0		.764	53.2	21	1.0	+
387	do	19	S	25.0		.756	55.2	18	2.0	−
388	do	13	S	25.0		.761	54.0	21	2.0	+
389	do	16	S	25.0		.764	53.2	21	1.5	+
390	do	19	S	25.0		.759	54.5	18	1.0	−
391	do	19	G	25.0		.759	54.5	18	1.5	−
392	do	13	G	25.0		.761	54.0	21	2.0	+
393	do	14	S	25.0		.766	52.8	18	2.0	+

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marketed in July, 1921—Continued.

Distillation range.												Recovery (per cent).	Distillation loss (per cent).	Sample No.
Initial boiling point.	10 per cent.	20 per cent.	30 per cent.	40 per cent.	50 per cent.	60 per cent.	70 per cent.	80 per cent.	90 per cent.	End point.	Average boiling point.			
145	196	214	230	248	264	282	306	333	367	430	273	97.0	2.0	354
63	91	101	110	120	129	139	152	167	186	221	134			
154	207	225	234	255	279	297	318	342	379	442	284	97.5	1.1	355
68	97	107	112	124	137	147	159	172	193	228	140			
149	196	212	228	244	261	282	304	325	365	433	273	97.0	1.8	356
65	91	100	109	118	127	139	151	163	185	223	134			
127	187	210	230	250	266	297	320	354	401	469	282	96.5	2.5	357
53	86	99	110	121	130	147	160	179	205	243	139			
127	169	194	223	252	280	311	343	376	415	466	288	96.5	2.3	358
53	76	90	106	122	138	155	173	191	213	241	142			
131	189	216	237	259	280	304	322	356	397	451	286	97.0	1.8	359
55	87	102	114	126	138	151	161	180	203	233	141			
129	181	210	230	252	264	286	315	338	372	417	271	97.0	2.0	360
54	83	99	110	122	129	141	157	170	189	214	133			
120	183	208	228	250	268	293	311	352	403	464	280	95.0	3.4	361
49	84	98	109	121	131	145	155	178	206	240	138			
126	176	199	221	243	264	291	322	358	410	469	280	97.0	1.5	362
52	80	93	105	117	129	144	161	181	210	243	138			
120	199	228	252	268	288	306	324	343	381	450	288	96.5	2.3	363
49	93	109	122	131	142	152	162	173	194	232	142			
120	181	208	234	253	275	298	318	343	363	423	275	97.0	2.0	364
49	83	98	112	123	135	148	159	173	184	217	135			
127	190	221	248	270	286	307	329	352	387	435	286	96.5	2.3	365
53	88	105	120	132	141	153	165	178	197	224	141			
124	167	196	223	255	291	325	356	385	412	453	289	96.0	2.7	366
51	75	91	106	124	144	163	180	196	211	234	143			
120	160	181	199	219	239	261	293	327	374	432	255	97.0	1.8	367
49	71	83	93	104	115	127	145	164	190	222	124			
124	176	208	237	259	282	306	318	351	381	417	279	96.0	2.6	368
51	80	98	114	126	139	152	159	177	194	214	137			
113	140	156	172	189	205	221	241	270	316	397	219	96.0	2.8	369
45	60	69	78	87	96	105	116	132	158	203	104			
145	189	212	234	253	275	293	331	358	397	469	288	97.0	1.6	370
63	87	100	112	123	135	145	166	181	203	243	142			
127	190	217	239	259	280	309	331	361	405	455	289	96.5	2.1	371
53	88	103	115	126	138	154	166	183	207	235	143			
135	190	212	235	259	282	313	338	369	408	462	291	97.0	1.4	372
57	88	100	113	126	139	156	170	187	209	239	144			
131	190	219	241	262	282	313	342	383	410	459	291	97.0	2.0	373
55	88	104	116	128	139	156	172	184	210	237	144			
117	172	199	221	239	257	280	304	338	388	455	270	97.0	1.8	374
47	78	93	105	115	125	138	151	170	198	235	132			
142	196	219	239	255	275	298	322	351	390	451	286	97.5	1.2	375
61	91	104	115	124	135	148	161	177	199	233	141			
122	172	189	203	214	228	243	264	284	331	394	241	96.5	2.3	376
50	78	87	95	101	109	117	129	140	166	201	116			
145	198	219	239	259	282	306	331	360	399	444	289	96.5	2.5	377
63	92	104	115	126	139	152	166	182	204	229	143			
129	187	217	241	262	286	311	331	360	390	423	286	97.0	2.0	378
54	86	103	116	128	141	155	166	182	199	217	141			
122	158	176	192	205	219	230	248	268	298	365	226	97.0	2.0	379
50	70	80	89	96	104	110	120	131	148	185	108			
118	160	183	203	217	232	244	261	277	306	356	232	97.0	2.0	380
48	71	84	95	103	111	118	127	136	152	180	111			
122	183	216	241	264	288	309	333	363	392	423	284	95.5	3.3	381
50	84	102	116	129	142	154	167	184	200	217	140			
136	201	210	234	248	261	275	293	313	347	406	266	96.5	2.3	382
58	94	99	112	120	127	135	145	156	175	208	130			
140	196	216	232	244	259	275	295	320	360	426	270	97.0	1.6	383
60	91	102	111	118	126	135	146	160	182	219	132			
113	169	203	232	253	275	297	316	340	376	433	273	97.0	1.8	384
45	76	95	111	123	135	147	158	171	191	223	134			
126	174	198	214	228	244	261	282	304	343	424	255	97.0	2.0	385
52	79	92	101	109	118	127	139	151	173	218	124			
120	167	203	232	255	275	298	320	343	379	433	275	97.0	1.8	386
49	75	95	111	124	135	148	160	173	193	223	135			
122	172	198	214	230	246	262	282	306	345	419	253	97.0	1.8	187
50	78	92	101	110	119	128	139	152	174	215	123			
142	199	219	234	246	261	277	295	316	349	414	268	97.0	1.8	388
61	93	104	112	119	127	136	146	158	176	212	131			
118	165	199	230	253	273	293	315	340	376	428	271	97.0	1.8	389
48	74	93	110	123	134	145	157	171	191	220	133			
127	178	199	216	232	246	262	282	306	343	424	255	97.5	1.5	390
53	81	93	102	111	119	128	139	152	173	218	124			
124	176	199	216	232	246	264	282	309	349	419	255	96.5	2.5	391
51	80	93	102	111	119	129	139	154	176	215	124			
138	199	210	234	246	262	277	295	316	349	412	268	97.0	1.8	392
59	93	99	112	119	128	136	146	158	176	211	131			
142	194	212	228	243	259	275	295	320	358	419	268	97.0	2.0	393
61	90	100	109	117	126	135	146	160	181	215	131			

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